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ELEMENTS

OF

PHARMACY, MATERIA MEDICA,

AND

THERAPEUTICS.

ELEMENTS

OF

PHARMACY,

MATERIA MEDICA,

AND

THERAPEUTICS.

BY

WILLIAM WHITLA, M.D.,

PHYSICIAN TO THE BELFAST ROYAL HOSPITAL;

CONSULTING PHYSICIAN TO THE ULSTER HOSPITAL FOR DISEASES OF WOMEN AND CHILDREN.

With Lithographs and Woodcuts.

THIRD EDITION.

LONDON: HENRY RENSHAW, 356, STRAND.

1885.

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TO

THE MEMORY OF

JAMES WHITLA, L.A.H.D.,

WHO FIRST INSTILLED INTO THE AUTHOR'S MIND

THE PRINCIPLES OF

PHARMACY, MATERIA MEDICA,

AND

THERAPEUTICS,

THIS VOLUME IS AFFECTIONATELY AND

GRATEFULLY DEDICATED

BY HIS BROTHER AND PUPIL.

PREFACE TO THE FIRST EDITION.

THE aim of this little work is to give to the student of medicine such information in a concise form as he generally has to sift out of two or more of the larger manuals. So many valuable volumes have been written on Materia Medica and Therapeutics as to leave little necessity for another; but it is not the intention of the writer to presume that this work will take the place of any of them, the question of space necessitating the knowledge being given to the reader often in a very fragmentary condition.

The arrangement of the subject, which has been sanctioned by custom, has been departed from, the work being divided into distinct and separate sections, and the drugs arranged alphabetically. The writer found that most students in grappling with Materia Medica generally read the Therapeutics of each remedy once or twice over, while its preparations had to be committed to memory. Thus, a process of confused selection always distracted and prevented that clear view of each detail so necessary to ensure a thorough grasp of every branch of the subject. Many students, too, have already mastered the chemistry of each drug in the laboratory, and hence to such an arrangement like the one adopted will probably be beneficial; whilst to those who have not, the condensed bird's-eye view of the subject may be appreciated. The writer is satisfied that this plan is open to serious objections, as is the most generally followed one, but he hopes that it may assist the already over-taxed student, who often fails to get any idea of

the subject at all if the matter be not placed in a condensed form within his reach.

Actuated by the feeling, that Pharmacy is one of the most important sections of Materia Medica, he has laboured to put this generally neglected branch in as attractive a light as possible, and has called to his aid the few original woodcuts in the first part of the work.

This brief outline of Pharmacy is in no way intended to replace that *practical* knowledge of the art which the writer believes is an essential accomplishment of every educated physician, and which he hopes to soon see rendered compulsory by examining bodies.

The condensation required in every page to keep the work in a small compass prevented that full recognition of the labours of many in the advancement of Materia Medica, which the writer would have desired.

He is grateful for the kind assistance of Mr. J. O'Neill, M.A., in the preparation of the Grammatical Aids to Prescription Writing.

BELFAST, *December, 1881.*

PREFACE TO THE THIRD EDITION.

THE rapid exhaustion (in a few months) of the second edition, and the delay caused by waiting for the new Pharmacopœia, have thrown this work out of print for some time.

It was found necessary to alter the order of arrangement of the different parts of the book, with a view of facilitating its rapid transit through the press. The section on the Administration of Medicines and Prescribing, which formerly appeared near the end of the volume, is now placed before the Materia Medica section, and apparently with advantage. The plan of the work is not, however, interfered with, and as stated in the preface to the second edition—

"The almost universally favourable way in which the work has been reviewed, and the many friendly criticisms received from practitioners and teachers, are helps for which the Author is deeply grateful; and they have convinced him that the alphabetical and sectional arrangement of the book, which he adopted with diffidence and some amount of misgiving, should not in any way be altered or departed from in the present issue."

By omitting the Official Tests and condensing the printing of the index, nearly 50 pages of entirely new matter have been added without any material increase in the bulk of the volume. The section on Non-official Remedies is entirely re-written, and the Author hopes is brought quite up to the present date.

The remainder of the work has been so closely revised that

it also may be said to be re-written, and all the recent additions of the new B.P. are incorporated in the text.

The Author is indebted to Mr. Goskar for his careful revision of the chemical reactions in Part VI., and to Mr. William McDade for his assistance in correcting the proof-sheets, and forwarding the work through the press.

8, COLLEGE SQUARE NORTH, BELFAST.
September 26th, 1885.

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INTRODUCTION.

THE words MATERIA MEDICA imply a description of the agents used in the treatment of disease, their preparation, actions, and uses; but owing to the rapid advance made in our knowledge of remedies, special terms are being daily used to designate the different departments in this extensive subject; and we confine the words

MATERIA MEDICA to the description of remedies, their origin, source, &c.,

PHARMACY to the methods by which they are prepared for administration,

PHARMACOLOGY to the science of their action on a healthy organism, and

THERAPEUTICS to their application in the treatment of disease.

The term Materia Medica, even so restricted in its application, embraces Botany, Zoology, and Chemistry, and, indeed, is built up of these sciences.

We may divide the science and art of Pharmacy into two distinct divisions:

EXTEMPORANEOUS PHARMACY, and

OFFICIAL PHARMACY.

The first head will include the various operations of compounding and dispensing remedies from the prescriptions of the physician, and under Official Pharmacy will be briefly defined the different processes mentioned in the Pharmacopœia

in the direetions given for the preparation of its numerous drugs and formulæ, and under the head of Materia Mediea, in addition to the deseription, &e., of the various drugs in the Pharmaeopœia, will be grouped together the Offieial Preparations themselves, mostly in tabular form, so that the student can have a bird's-eye view of their eomposition and doses.

The Pharmaeology of eaeh drug will be given under its name in the seetion of this work devoted to Therapeuties, where its *physiological* aetion will be briefly diseussed in eonneetion with its *therapeutic* indieations and uses.

Under the head of Administration of Medieines will be treated the seienee of writing and reading preseriptions, and a short glossary of terms and abbreviations used by physieians in ordering remedies.

PART I.

PHARMACY.

CHAPTER I.

EXTEMPORANEOUS PHARMACY, OR THE COMPOUNDING AND DISPENSING OF PRESCRIPTIONS.

THE student is often confused by the frequent use of the words "compounding" and "dispensing." The former may be said to apply to the mixing, blending, or preparing of the drugs ordered in a prescription, while the latter refers to the way in which they are put up, labelled, and sent out to the patient: thus the incorporation of a mixture of several substances is spoken of as its *compounding*, after which it is to be *dispensed* in a flat, square, or round bottle; but if a prescription, for example, should contain an order for twelve five-grain Dover's powders, it would be simply a case of dispensing, since the medicine is always kept compounded by the dispenser.

It has been said that "no one should be allowed to *write* a prescription unless he is able to *compound* it," and if such were the rule of examining boards, doubtless more useful and more elegant prescriptions would be the fashion, and even if it were not so, the training requisite to make a good dispenser would be a great accomplishment to the practical physician, teaching him habits of neatness, readiness, and accuracy obtainable in no other way.

The compounding of medicines can only be really learned at the dispensing counter; but a few general directions will be here given as a guide to the student, or a help to one who may find himself compelled to dispense his own remedies without

previous training; and at the start he may be reminded that it is an essentially practical study.

Once the prescription is in the hand of the dispenser he must give it his undivided and concentrated attention. Day-dreaming must be for the moment laid aside, and in proportion to the thoroughness with which he isolates himself from everything but the sheet of paper before him, so will his success be. The prescription should first be read carefully through, and any inconsistency of dose noticed. Difficulties in reading and deciphering will nearly always disappear on a careful comparison of the formation of the letters in the doubtful word with those in the unmistakable portions of the prescription. If an evidently poisonous, or even an unusually large dose, is ordered, or if substances absolutely incompatible are prescribed, it will be well to consult the prescriber before proceeding further, but this will not be a likely or common occurrence. In compounding almost every prescription, there are several processes continually being employed which deserve a few passing remarks.

Weighing, the essential element of which is accuracy, is generally only required in dealing with small quantities as rarely more than one ounce of any solid is ordered in a prescription; more commonly it is only with grains or drams that the dispenser is directed to work, and in dealing with quantities from a few grains to as many drams, the ordinary fixed upright beam and scales, which are found on every dispensing counter, answer all purposes. They are generally provided with one moveable glass pan, which should be opposite the operator's right hand, and on to which the substance to be weighed is to be gradually placed, the weights having been previously put on the opposite scale. The pan, or scale, should be invariably wiped with a dry cloth each time after use. The omission of this is one of the minute points that stamp a slovenly compounder, and as a rule he who will not take the trouble to leave his scales and weights tidy after him will not take the trouble to weigh accurately the medicines prescribed.

For minute quantities of powerful drugs, like morphine, strychnine, and most active substances under two grains in weight, the scales that are being constantly used to weigh as much as two or three drams should not be employed. For this purpose the small beam and scales figured should be used, and the substance gradually added, particle after particle, from a small spatula, till the scale comes to the level of the opposite, and remains there. In this manner the $\frac{1}{100}$ of a grain can be easily appreciated.

It is very often necessary to weigh small quantities of soft extracts for pills. This should only be done in this way:—Two little pieces of smooth writing paper should be made of

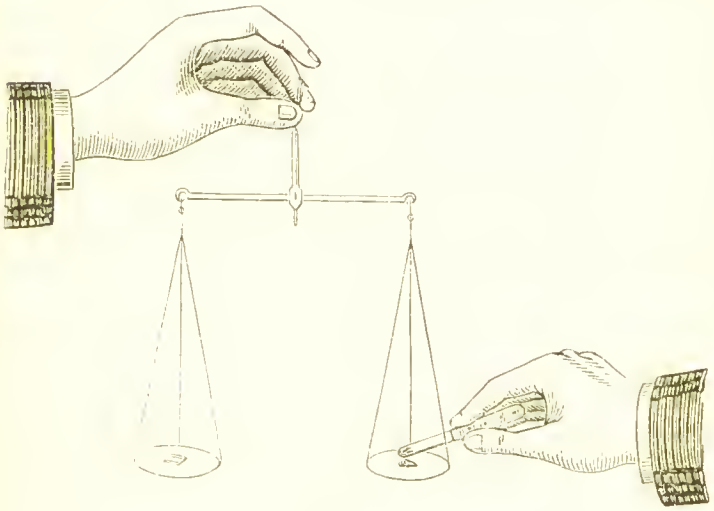


Fig. 1.

the same size, which is accurately done by cutting a piece out of two leaves, one placed in contact with the other. When two pieces of precisely the same size and weight are thus obtained, one should be placed on the left hand scale along with the weights; the other is to receive upon it the soft substance, and to be placed on the opposite scale, and when the requisite weight of material is added it can easily be detached from the paper with a knife. The same plan should be used with corrosive substances, like iodine, if the scale is not of glass.

The Pharmacopœia recognises no weight between a grain and an ounce, the ounce being equal to 437½ grains, and the pound being equal to 16 ounces, or 7,000 grains. These are the only weights that a student has to learn (unless that he is expected to have some idea of the metrical system).

It will be seen that in this weight, which is called the Imperial Standard, or Avoirdupois weight, there is no dram or scruple, but in the preface to the Pharmacopœia it is written that "it will be optional with the Physician *in prescribing* to use the symbols of the dram (ʒ) and the scruple (℈), the former representing 60 and the latter 20 grains." However,

it is now becoming the custom to order solids by grains or ounces, and confine the use of the dram to the liquid measure of 60 minims, or the $\frac{1}{8}$th part of a *fluid* ounce.

If, therefore, the dispenser meets with a dram or a scruple of a solid substance in a prescription, he is to put in 60 or 20 grains—though strictly 54$\frac{1}{2}$ grs. and 18 grs. are respectively equivalent to the $\frac{1}{8}$th and $\frac{1}{24}$th of an avoirdupois ounce.

The **Measuring** of liquids is a simple process, but, like many others, requires care and practice, and should be done always according to rule. Graduated glass measures are used of various shapes, which should have the lines marked both in front and at the back. The measure should be held between the thumb and next two fingers of the left hand, as is well shown in Fig. 2, and raised nearly to the level of the dispenser's eye. The bottle to be poured from is grasped firmly by the right hand, as in the Figure, the stopper being previously withdrawn and held by the little finger of the opposite hand.



Fig. 2.

The fluid is then poured out, the foot of the measure being held horizontally, the level of the liquid being tested by the lines on its front and back aspects. In looking through a quantity of liquid in a glass, two lines, or a double line, may be noticed, the upper one being caused by the concave surface of the liquid, produced by capillary attraction. The lower line, which is the true level, is the one to be taken into account in measuring. *Never pour out with the label downwards*, otherwise the drop of moisture left on the lip will trickle down and injure it. The label should be *always* on the side of the bottle which is upwards, as in the Figure.

For measuring small quantities of medicine (and it is generally an active medicine which is ordered in small quantity), the measure which is used for ounces should not be employed,

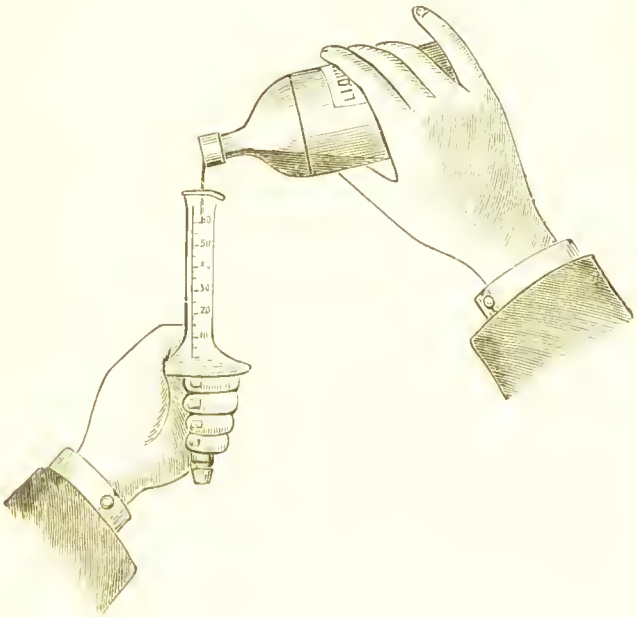


Fig. 3.

as it will be found impossible to be accurate in pouring a dram into the bottom of a two-ounce glass. The measure which is figured should be then used; it is known as a minim measure, and contains either one or two drams.

It may be held like the larger glass, but the careful and neat dispenser will hold it as in the Figure, which does not interfere with the light passing through even a minute quantity near the bottom. Some hold the larger measure in the same way. In measuring liquids in very narrow glasses like the one figured, the surface of the liquid will be found to be *deeply* concave, owing to capillary attraction being stronger than in wide vessels, and it is sometimes puzzling to get the true level, which should be midway between the highest point close to the glass, and the lowest in the centre. It is not safe to count upon the lowest line as in working with the larger measures, because if we did the fluid which is attracted to the glass would not be included.

Substances like copaiba and castor oil should not be measured—not, however, because of the reason always assigned, that the measure is so difficult to clean, for accuracy should sacrifice every other consideration in compounding, but because of the fact that if one ounce of such a substance is carefully measured about seven-eighths of it only will be got out of the glass. Hence it is advisable to either weigh it, making due allowance for its specific gravity, or else pour it into the bottle in which it is to be dispensed, having previously marked with a strip of paper the extent occupied by an ounce of water in the same bottle. Before returning the stopper into a bottle out of which a liquid has been poured, the drop that hangs from the lip should be caught upon the bottom of the stopper by simply touching it—thus continual moisture is generally prevented trickling down the side of the bottle; this little detail should be carefully attended to in the case of acids, corrosive liquids, and syrups.

Dropping.—Few have any fixed notion of how a liquid should be made to flow in single drops out of an ordinary stoppered bottle; a glance at the Figure will do a great deal to dispel any difficulty in the matter. The bottle should be lightly grasped in the right hand by all the fingers, except the index one, and held in a vertical position with the bottom downwards, till the stopper is lifted partially out by the fingers of the left hand, and held there by the right index finger, which presses it downward as the bottle is sloped to allow the liquid to drop out. Before permitting the drops to fall into any quantity of other medicine, a few should be allowed to drop on the floor till the dispenser is satisfied he has perfect control over the regularity with which the drops issue from the bottle in his hand, otherwise they might come out with a rush, rendering it impossible to count them, in which case the liquid or medicine into which they fall must necessarily be rejected.

This may be avoided by the unpractised dispenser allowing the drops to fall into an empty measure, when, if too many flow out, he can reject them without risking the liquid into which they are to go ; but if the drops be volatile, this should not be done. Liquids like chloroform, hydrocyanic acid, ether, nitrite of amyl, &c., should not be dropped, but always measured. A ten or twenty per cent. solution of such substances can be kept in stock, so that there may be no difficulty in accurately measuring the smallest quantities, as when two or three drops of dilute hydrocyanic acid are ordered in a draught.



Fig. 1.

It is a good rule to let each drop reach its destination before another flows out. If the drops hesitate to flow at the start, the lip of the bottle should be wetted. When the dropping has concluded, the stopper is taken altogether out for an instant to allow the liquid accumulated about the neck to flow back again into the bottle before the stopper is thrust home; various bottles, with patent stoppers, have been devised to facilitate dropping; but, as a rule, every requirement is met by the

above plan. The student should remember that a drop is a vague and indefinite quantity, supposed to be identical with a minim, which it seldom is. Elaborate tables have been prepared, showing how many drops of certain liquid preparations are found to correspond with one dram: thus it is generally stated that there are 120 drops of tincture of digitalis or laudanum in one fluid dram, and 45 of Prussic acid in the same bulk. It is, however, well known that the number and size of the drops depend, not so much upon the nature of the liquid, as upon some accidental circumstances—as the shape and size of the stopper, or especially *the shape of the lip of the bottle*, and how much wet or moisture is about it, &c., &c. The system of ordering drops should be entirely given up, and minims directed to be measured instead, unless, perhaps, when two or three drops of a flavouring essence are ordered in a mixture.

Hydrocyanic acid is best measured with a long graduated syringe, and many other liquids could be treated in a similar way with advantage.

CHAPTER II.

MIXING OR MIXTURE-MAKING.

UNDER the term "Mixture" in Pharmacy is included every extemporaneous fluid compound intended for internal use, except a few bearing distinctive names—as draughts or enemata. It would be difficult to give such general directions to the dispenser as would equally apply to the preparation of so many really different compounds—as solutions, emulsions, decoctions, &c.; but a little practical experience will soon show him how he may apply the knowledge gained in making one class of preparations to aid him in compounding another.

Mixtures are ordered and dispensed in 2, 3, 4, 6, 8, 10, and 12 ounce bottles, and occasionally in 16, and 20 ounce; and taking the simplest form of mixture, where two or more fluid medicines are ordered together, it will be seen that the compounding of this will only mean the measuring of the different ingredients in a glass and pouring them into a bottle; still, this must be done methodically, and attention to the following is advisable:—Until the dispenser has had considerable experience he should, after reading over the prescription, carry

the different medicine bottles required from their different places and set them down beside him before he begins to measure, otherwise he "may lose his head," or get confused in travelling from one part of the surgery to another. This practice, however, should be no excuse for bottles being left upon the dispensing counter; after the mixture is made each should be carefully put back into its proper position; and the same law applies to every operation in Pharmacy, for nothing should be left lying about out of its place: it is in this way mistakes are often made. It will be noticed that in carrying a stock bottle from its shelf, collecting it with others where the dispenser is to work, and putting it back after he has finished, its label will be certain to be examined at least *three* times. The skilful compounder will make up a mixture more expeditiously by taking the measure-glass in the left hand, as if about to use it as previously described, and the prescription between the middle two fingers of the same hand, and, proceeding with his right hand entirely free, walking to and fro he can compound his mixtures as quickly and accurately as if all were within the reach of his hand—as they should be when possible. This is well shown in the Figure. Care is requisite to prevent the paper being soiled.

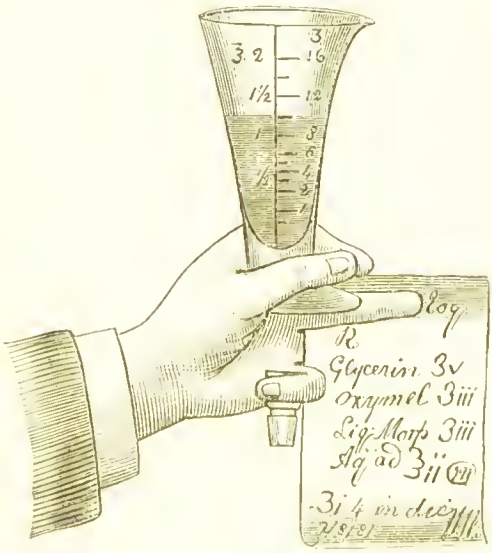


Fig. 5.

As regards the *order* in mixing liquids for a simple mixture, it is not of so much importance as in making emulsions, and often the ingredients can be mixed in the order in which they are written. It is a good plan to pour the tinctures or spirituous fluids (as they are measured) into the bottle in which the mixture is to be made, mix them, and then add the syrups or essences, and finally fill up with the water or infusion ordered; in this way a better mixture is often made than if the tinctures were each singly added to a large body of water, when their resinous principles would be sure to be precipitated. Suppose in a prescription of eight ounces of mixture, containing two ounces of tinctures, one ounce of mucilage, and five ounces of water, if the dispenser added the mucilage to the undiluted tinctures, an unsightly mess would be the result; the mucilage should either be added last, or, largely diluted with the water, before adding the tinctures; but the difficulty about the *order* of mixing ingredients will be found to be more imaginary than real—a little common sense and experience will soon overcome it. There is, however, one rule which is almost universally neglected, and it is of importance:—If there be a very poisonous substance, like Prussic acid, strychnine, aconite, arsenic, corrosive sublimate, &c., ordered in a mixture, it should be put in the *last thing* before corking, unless there be some reason to the contrary. The force of this is obvious, for, if this be the dispenser's habit or rule, the possibility of his putting it in twice is out of the question; and often when the attention is unavoidably arrested the ablest will forget what he has just accomplished. All mixtures should be briskly shaken before the label is put on, to ensure thorough incorporation.

Distilled water should be invariably used; no doubt in many instances it will be of little moment, but a mixture made at one time with distilled water and at another with plain fountain water will taste differently; and, on the whole, it will be found advisable always to use it to ensure uniformity.

Should a mixture be filtered if not bright and clear? Unless specially ordered it should not, or unless some of the articles employed in its preparation were not as bright as they should be; it should always be strained through wetted wool or tow plugged lightly into a funnel, if any foreign particles are observed in it; this will almost always be necessary if the mixture has been made in a mortar; and most of the next class of mixtures get dirt incorporated with them, no matter how careful the dispenser is, and there are often foreign particles mixed up with the salt before solution which are not visible till water is added. It will be always necessary to run

a little water through the strainer before pouring in the medicine. Suppose, now, the prescription contains a solid substance to be dissolved in the mixture, the dispenser, if the substance is very easily dissolved, may weigh it, drop it into the bottle by means of a little paper bent into a V shape (off which most powders will pour like liquids), add the water or vehicle ordered, and shake briskly till the salt is dissolved; this often does away with the necessity of straining; but if the salt dissolve slowly, or if there be more of it ordered than the water will dissolve, then it must be rubbed up in a mortar with a pestle—to use which skilfully and neatly requires a good deal of practice and care.



Fig. 6.

Fig. 6 represents the mortar being used to triturate a hard substance. The pestle is firmly grasped by the right hand, and power is applied from the *shoulder and arm, the wrist being kept rigid*, and the elbow nearly stiff. By a series of rotatory movements, chiefly at the shoulder joint, the pestle is made to

travel slowly round the sides of the mortar—always being brought in the same direction, that is *towards* the operator's body, not from it—each rotation becoming shorter and quicker until the centre of the mortar is reached, when a few large sweeps bring it out to the sides again, and the same movements are repeated as before—the object being to crush each particle between the sides of the mortar and the pestle. The mortar should be steadied by the left hand, and as the material gathers towards the handle of the pestle, it is to be scraped off with a spatula—which should occasionally be swept round the inside of the mortar. In this manner hard gritty substances are reduced to a fine powder.

If more of a salt is ordered than the water will dissolve, it should be in this way well rubbed up with successive portions of water, and dispensed as a fine powder lying at the bottom of the mixture, and not, as is often done, presented to the patient in large crystals which he doubts whether to swallow or reject. Warm water would probably dissolve the salt and give a clear mixture, but on cooling, large crystals would form on the bottom and sides of the bottle.

Another class of mixtures is often ordered where a vegetable powder, as rhubarb or ginger, or a substance like precipitated sulphur or bismuth, is directed to be compounded with water generally thickened with a little syrup or mucilage, in which cases the most careless would hardly think of pouring the powder into the bottle and filling up with water, as it would thus reach the patient in little hard lumps or pellets. The powder should be weighed, and put into a porcelain or wedgewood mortar, with as much water as will make a paste, and after rubbing it smooth, more water is gradually added till a uniform mixture is obtained. The trituration here is of a different nature to that required in powdering substances or grinding them, as in the last Figure. In this instance the powder is already fine, and only its intimate admixture with water is required—hence the mortar is used in a different way, as Fig. 7 shows. A swift graceful movement is communicated to the pestle by the *wrist*, the handle being lightly grasped as a pen is held, and no motion should be allowed at the elbow or shoulder; as in the last instance the pestle is made to sweep round the sides of the mortar always in the direction inwards or towards the dispenser, never "off" him. If syrup or mucilage is ordered to help the suspension of such powder in a mixture, it is advisable to rub the powder up with it first before adding water, and shaking all thoroughly before labelling.



Fig. 7.

When calcined magnesia is ordered in a mixture, an exception to the above rule of rubbing in a mortar may be made: thus, suppose an 8 oz. mixture, with 2 ounces of syrups or tinctures, 2 drams of magnesia, and 6 ounces of water, be prescribed, here the dispenser may measure the water first in a large measure, weigh the magnesia and drop it on to the surface of the water, when it will gradually sink to the bottom as a perfectly smooth and uniform sediment. During its sinking he measures out the fluid ingredients, pours them into the bottle in which they are to be dispensed, by which time the magnesia and water are ready for pouring in on the top of them. This completes the mixture, which is whiter and more uniform than if rubbed up in a mortar, however clean.

Often a good deal of trouble is experienced with the froth that rises, especially upon vegetable solutions after agitation, preventing the bottle being filled or corked. A few drops of spirit cause this to rapidly disappear, and it is a good plan, if there be any spirituous liquid in the prescription, to keep a little of this to the last for this purpose. All mixtures with any deposit should have a label directing the bottle to be shaken before pouring out, and in all cases where the dis-

penser is in doubt about a mixture depositing a sediment he should err on the safe side, and put on a "shake the bottle" label before sending it to the patient.*

The next class of mixtures includes emulsions. They require more care and skill in their preparation and prescribing than most other extemporaneous compounds. An emulsion is a watery mixture resembling milk in appearance, containing an oil or resin in suspension, and not capable of easy or ready separation. The suspension of the oil or resin is effected through the agency of several substances, as gum, soap, alkali, or yolk of egg.

Several substances when rubbed up with water in a mortar make perfect emulsions, the gum-resins ammoniacum, myrrh, and asafœtida behave in this way. The milky mixtures thus prepared are called *natural* emulsions, and the explanation of the phenomenon is simple—each substance contains, in addition to its resin, as much gum as will suspend it when water is added. If the pharmacist wishes, then, to make an emulsion with a resin, he imitates this natural preparation by adding gum acacia, or tragacanth, such is the official mixture of guaiacum, in which the resin is ordered to be triturated with a little sugar and gum, adding gradually the cinnamon water. The mucilage for emulsions should be always recently made, and not *acid*. The mucilage made from Pulv. Acaciæ is generally acid.

Oils are emulsified either by rubbing with gum or by adding an alkali (which makes a sort of soap with the oil), or by both gum and alkali, which is the most common method. Copaiba is made into an emulsion in a similar manner. Volatile oils require to be mixed with some fixed oil before being made into an emulsion, or they may be rubbed up with yolk of egg.

The powdered gum and water, or mucilage, should be measured into a mortar, and the oil gradually added, with continual *light* rubbing, the pestle being always moved in the same direction, more oil being put in only after the first added has been blended with the water. Generally speaking, there should be as much oil as watery fluid at this stage.

* It is a custom to direct all mixtures containing Prussic acid to be shaken before use. This has arisen from a mistaken notion that the acid floats upon the top when the mixture is allowed to rest. Such is not the case, but the very volatile ingredients in a half-filled bottle of mixture may rise in vapour and condense upon the inside of the empty part of the bottle, and on a dose being poured out it would contain a relatively larger proportion of the volatile substance, hence even in these cases a "shake the bottle" label should be put on, one thing being certain—that it can do no harm if unnecessary.

If the mixture gets too thick during the rubbing, a little water may be added from time to time to thin it; and when all the oil is thus incorporated, the mixture is poured into the bottle in which it is to be dispensed, and any other ingredients ordered are to be very cautiously added, each freely diluted before being poured in, tinctures or spirituous liquors always being added *last*, in very small quantity at a time, and diluted; neutral or acid salts, if ordered, must be very cautiously added, as they run a fair chance of spoiling the union of the oil and water, but many alkaline salts strengthen it.

The object of the dispenser should be to cause minute division of the particles of the oil, and to get each minute particle covered over with a film of mucilage or albumen, which prevents its uniting again with neighbouring globules.

Some dispensers put the powdered gum or mucilage into the bottle with a little water, adding gradually the oil, with brisk shaking; such a plan is not to be recommended. Alkaline emulsions may, however, be prepared in this way, and it is the way in which copaiba is generally treated; the alkali, commonly solution of potash, mixed with as much water as there is balsam or oil, is put into the bottle, the balsam added, and after brisk agitation, complete incorporation will be effected, the bottle being gradually filled up, with continual shaking. The balsam or oil is often weighed into the dispensing bottle, and this is the most correct method; but it should be remembered, if a *perfect* emulsion is desired, this plan should not be followed, as the oil or balsam adheres so firmly to the sides that globules will always be floating to the surface after the dispenser thinks all is safe. This may be obviated by pouring the emulsion into a new bottle, after all the ingredients have been added.

Tincture of senega in small quantity has the power of emulsifying fats and oils very efficiently. 5 minims will emulsify $\frac{1}{2}$ oz. of fixed oil.

Tinctura Quillayæ Saponariæ (1 oz. to 1 pint) possesses the same power, and is much used on the Continent for making emulsions.

The mixture having been compounded and put into the bottle in which it is to be dispensed, should be corked, and this must be done with care, as there are few things impress the patient so unfavourably as a cracked, dirty, or badly fitting cork; the dispenser should take the measure of the neck of the bottle with his eye before fitting the cork, and once it has been tried in the bottle it should not be put back amongst the others into the drawer, but regarded as a *soiled* cork. It is the custom to seal over the top of the cork with wax; coloured paper, leather,

or tinfoil may be used; if leather is used in tying over a bottle it should be very thin, and put on quite wet, and without a single crease; it makes the most elegant finish, but is not commonly used. Labelling should be done with the most scrupulous neatness and distinctness, all flourishes being condemned. The margins of the label should be carefully trimmed, and a new label should never be put on over an old one. No mixture should reach a patient without being checked with care, when possible, by a second person.

CHAPTER III.

MIXTURES—*Continued.*

It might not be out of place here to refer to a few of the difficulties in Mixture-making which the student may expect to meet with. The following may be taken as examples:—

Quinine in the form of a Mixture is one of the most frequently prescribed drugs in the Pharmacopœia. Often it is ordered in combination with a little flavouring syrup and water, without any acid for its solution—and the officious dispenser occasionally falls into the error of adding sulphuric acid to effect its solution. This is a mistake. The quinine should be rubbed up in a mortar with a little water, or added to the vehicle in its crystalline state, with directions that the bottle is to be well shaken before each dose is poured out.

When the acid is prescribed for its solution, the careless dispenser may drop the quinine into the concentrated acid previous to dilution with the vehicle or water, and an acid sulphate, which is only sparingly soluble, is the result. The acid should be freely diluted before the alkaloid is added.

Or **Quinine** may be ordered with aromatic spirit of ammonia, tinctures, spirit of nitrous ether, or other spirituous liquids along with glycerine or syrup and water. In this case the alkaloid may be dissolved in the concentrated spirit, and the watery portions *gradually* added after the glycerine or syrup, so that if the mixture be not too dilute, a clear solution, instead of a muddy mess, may be presented to the patient.

Or **Quinine** may be ordered with sulphuric acid and tannin, or some vegetable containing tannin, when a precipitate of tannate of quinine is the result. The dispenser should not fall into the error of filtering this latter out of the mixture.

Salicylate of Sodium or **Salicylic Acid** is occasionally ordered in a mixture with quinine, and the dispenser will find that a disgusting looking semi-solid mass forms in the bottle and refuses to pour out. This latter case he should regard as one of absolute incompatibility, calling for a consultation with the prescriber. If this is impossible, matters may be partially remedied by adding mucilage to the quinine, and gradually mixing in the salicylate dissolved in a large quantity of water, and shaking briskly.

Scale Preparations when ordered in a mixture should either be dissolved in a clean mortar, with warm water, or poured into the bottleful of the vehicle and agitated; if put into the dry bottle, and the water or vehicle added afterwards, a sticky mass cakes at the bottom.

Vegetable Extracts when prescribed in mixtures should be most carefully rubbed up in a *slightly* warmed mortar, with a little water, until a soft cream results, to which the vehicle is to be gradually added; if the extracts contain resinous matters, mucilage should be added by the prescriber.

Turpentine in a mixture will give the dispenser some trouble. If the emulsifying agent is left in his hands, he can make a good mixture with yolk of egg. It will require three eggs at least for one ounce of turpentine. This applies to most ethereal or essential oils. Thick mucilage answers, but not so well. Turpentine has been successfully combined with a watery vehicle by rubbing it up in a mortar, with about 2 per cent. of powdered Castile soap, adding the watery vehicle gradually, and shaking briskly.

Castor Oil should not be made into an emulsion with an alkali—fresh mucilage makes the best emulsifier.

Almond Oil emulsifies unsatisfactorily with mucilage or powdered gum. A small quantity of liquor potassæ or carbonate of potassium answers well, whilst a mixture of either of these with mucilage spoils an emulsion containing almond oil.

Spermaceti can be emulsified by rubbing it smooth in a mortar and adding a little spirit, just as in the powdering of camphor; after the evaporation of the spirit, yolk of egg, powdered gum, or thick mucilage—but preferably the former—will make a good mixture—especially if some syrup be present.

Cannabis Indica, Castor, Guaiacum, or other resinous tinctures, when ordered in the form of mixture, with directions for the use of an emulsifier according to the dispenser's fancy, will give some trouble. The best plan is to use a quantity of thick fresh mucilage, rather more than equal to the quantity of the tincture, which must be added only after dilution with water.

Borax, powdered and rubbed up with mucilage, forms a soft powder like moist sugar, which cannot be made liquid by the addition of any further quantity of mucilage; and acetate of lead, similarly treated, makes an opaque white jelly.

Spirit of Nitrous Ether will generally require to be neutralised with bicarbonate of potassium, before being compounded with bromide or iodide of potassium, otherwise free Br. or I. will be liberated, and the mixture darkened.

Subnitrate of Bismuth is often ordered in a mixture with bicarbonate of sodium, and unless very great care is taken in compounding them, by permitting decomposition at a gentle heat, carbon dioxide will be produced, and the bottle will burst. This may be prevented by using an equivalent quantity of the carbonate of bismuth.

Liquid Extract of Male Fern is generally ordered to be rubbed up with milk, fresh mucilage, or tragacanth, but egg will be found a better emulsifier.

Tincture of Tolu, Friar's Balsam, or **Tincture of Myrrh,** may be easily added to cough mixtures, when a small quantity of powdered tragacanth is ordered at the same time, and though the scrupulosity of the dispenser in closely following the letter of his prescription is to be admired, still if gum were added sometimes on his own responsibility, the unsightly messes which are presented to patients either through the oversight or innocence of the physician would be greatly improved. Sometimes the relations which exist between the physician and the dispenser will quite justify the latter in making an alteration, but it is a dangerous ground, and he must always hesitate before interfering, unless where there appears a very evident necessity. Each case must be considered on its own merits, and no rule can possibly be laid down for the guidance of the young dispenser.

A Draught is a small mixture which is to be swallowed at one dose; it generally contains 1, 1½, or 2 ounces, and is compounded and dispensed in every way like a mixture.

Liniments, Injections, Lotions, Collyria, or Eye Washes, and Gargles, are compounded in the same way as mixtures, and the dispenser will have no difficulty with them. All poisonous external applications should be dispensed in differently shaped bottles from those used for mixtures; the blue glass hexagons with three fluted sides are by far the best for this purpose, and less likely to be mistaken for mixture bottles than any others. Strong liniments, in addition to bearing the words, "for external use only," should be marked "poison." Injections, mouth washes, or unusually strong gargles, should be marked "not to be taken."

A Linctus or Linctare or Loch literally means any medicine of such a consistence that it has to be licked or lapped off a spoon. They are not now often prescribed, and when the dispenser meets with them he mixes the ingredients together as for an ordinary cough syrup or confection, and dispenses them in a plain bottle, or if too viscid for flowing, he puts them into a wide-mouthed bottle or ointment pot.

Electuaries, Conserves or Confections, are mixtures of a pasty consistence, generally containing powdered substances made into a soft mass with treacle, syrup, honey, &c. The substances prescribed in this form, if not already in fine powder, must be reduced to this condition and sifted; sulphur, rhubarb, jalap, ginger, and sulphate of magnesium are occasionally ordered in this form. The powders should be carefully triturated in a large mortar, and when thoroughly mixed the saccharine substance should be gradually added till a smooth, uniform, and impalpable paste is obtained. The powders should never be stirred into the treacle or honey, but the latter should be poured in upon the powder, and when compounded, the confection, if very soft, should be dispensed in a pot in which there is plenty of room for stirring up. If sulphate of magnesium is ordered, the dispenser may use the dried salt, allowing for its strength, as it is almost impossible to pulverise the ordinary drug.

CHAPTER IV.

THE COMPOUNDING AND DISPENSING OF POWDERS.

Though nearly every vegetable substance in the Pharmacopœia may be prescribed in the form of a powder, still the list of commonly ordered powders is not a very long one.

The physician may order substances to be dispensed in this form which are not kept in powder, and the dispenser will consequently be obliged to pulverise them. This is done on the small scale by using a mortar like the one in Fig. 6; the pestle is grasped in the same manner, but wielded very differently; it is raised and lowered in a quick or jerky fashion for a few inches, and in a straight up and down motion from the elbow, each stroke being aimed at a particle, which is thus crushed between the end of the pestle and the bottom of the mortar. When the coarser pieces have disappeared, the pestle is to be used as in Fig. 7, and the powder ground between the sides of the mortar and the end of the pestle till the required fineness is obtained. The mortar for such an operation should be of wedgwood, and not too highly polished, as the roughness of its interior facilitates pulverisation.

If the substance to be powdered for a prescription happens to be a root, or leaf, or herb, which is rare (as such are almost always kept powdered in stock), then an iron mortar with a lid is to be used, for any considerable force should not be employed with a wedgwood or porcelain pestle. After the grinding has been performed till single particles are no longer visible to the naked eye, the powder should be passed through a fine sieve, and for very small quantities it is sufficient to extemporise a little sieve by stretching a piece of fine muslin over the largest sized chip ointment box, out of which the bottom has been knocked, and securing it with a string or tight hoop like a drum head.

The bulk of a powder varies. Generally prescribers order less than twenty grains, often about five grains are prescribed. If only one powder is to be sent to the patient, it is simply weighed on the scale and placed upon a piece of paper, and, if containing more than one ingredient in a single powder, they should be carefully mixed on the paper with the point of a knife, for though the patient is to swallow the entire powder without division, and its mixture is practically of no importance, it looks careless, and does not impress him favourably on being able to distinguish different shades of yellow and blue in what he is about to take. Powder papers should be glazed, and for small powders about 4×5 inches. Different shades of colour are used, and some even prefer the paper unpolished. As a rule, paper such as is used for writing on is suitable. The white glazed demy, manufactured specially for the purpose, and sold by druggists' sundrymen, is the best powder-paper. It may be had cut in different sizes. To fold a powder requires a good deal of care and practice, and once learned it is never forgotten, and is useful when applied to

many other little operations. Though so simple, it is, however, a difficult task to describe in writing.

The following is the old-fashioned way of folding a powder: The powder being placed on the centre of the paper, which lies flat on the counter before him, the folder seizes the margin farthest from him between the second finger and thumb of his left hand, at the same moment seizing the near margin with the corresponding finger of the right hand; he brings them together, their edges looking directly upwards, only the edge of the margin nearest is half an inch higher than the edge which is farthest off him. This is very plainly seen in Fig. 8. The margins are held in this position with the second finger and thumb of each hand, while the folder turns down in a flap with his index fingers the upper margin over the lower. (The Figure shows this turning down as having commenced at the right-hand corner). The flap thus produced is turned over and bent upon itself, which finishes the folding process, except the bending down or in of the ends, which is done, as Fig. 9 describes, by simply bending them between the finger and thumb, or by creasing over a powder-folder made for the purpose, which secures all the powders being of exactly the same length. Some dispensers bend down the ends over a flat-bladed knife. After the powder is thus folded, its appearance is much improved by passing the blade of a spatula or ivory paper-knife firmly and rapidly over it, removing every crease, and preventing the mass of the powder causing a bulging in the



Fig. 8.

middle. This is always necessary when the powder weighs more than a scruple, and it is especially necessary when any considerable number is ordered to be dispensed in a box or envelope. Care is requisite in passing the spatula over bulky powders to keep the blade perfectly flat or horizontal, as otherwise its edge will readily tear through the paper. Very large powders, containing substances like Rochelle salt, soda, &c., can be uniformly flattened by striking them gently several times with the handle of the knife before passing the blade over them.

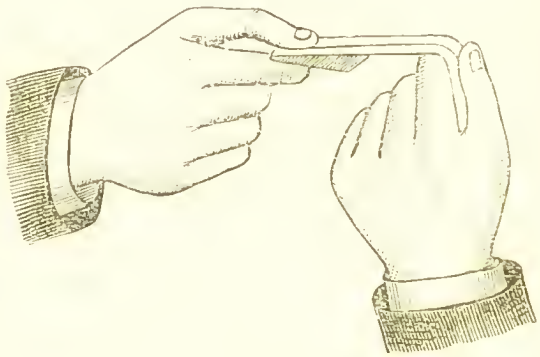


Fig. 9.

Pharmacists, however, nearly universally fold a powder in this way:—The dispenser places the paper before him on the counter or table with the powder in its centre, and brings the border of the paper farthest from him to within half an inch of the border next him; secures it in this position with his index fingers, whilst with his thumbs he turns the half inch of margin of the paper next him in a flap over it. This is again folded over on itself, which completes the folding (Fig. 10), the ends being turned down as in the first instance by the fingers, over a knife or on a powder folder.

A represents the farthest edge brought towards the folder; in B the edge next him is turned over in a flap upon this; in C and in D both are together turned over in a second flap; and the folding is completed except the turning back of the ends. The dotted lines show the space originally covered by the paper. In this method the powder is technically said to be folded "to" the dispenser. Most commonly, however, it is folded "off" him, and this is the proper way, only it is more difficult to see

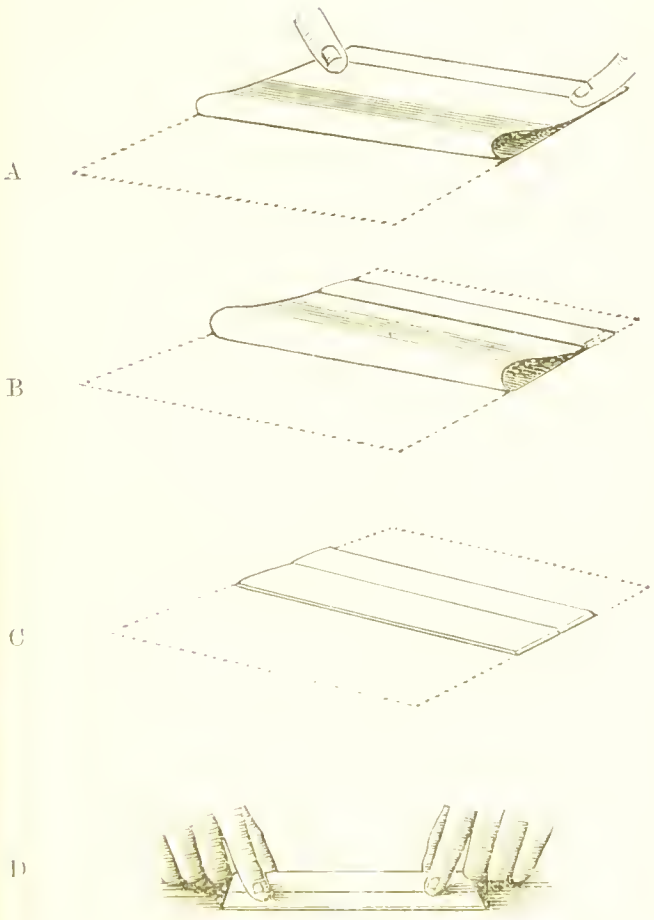


Fig. 10.

it for the first time. It is done in the same way precisely, except that the near edge of the paper is brought to within half an inch of the farthest edge, which is turned over on it, and again both are turned over as before.

The following still simpler method of folding a powder may be easily mastered by the student :—He places the paper before

him with the powder in its centre, and turning back into a flap about half an inch of the margin next him, he smooths it down flat upon itself. Into the crease of this flap he inserts the edge of the paper farthest from him, and bends both over exactly as in the two previous instances, and finishes the ends as before.

The first method is the most difficult to accomplish, but it is the best, as by it the dispenser folds large bulky powders, like magnesia, Gregory's powder, &c., which cannot be properly folded otherwise. Suppose 1 oz. of the sulphate of magnesium is to be dispensed in a paper, the dispenser weighs it out on a paper, and proceeds exactly as in the first instance of folding a small powder, as in Fig. 8. He does not, however, fold back the ends over a folder, but gathering in loosely the left end, he closes it so that the packet can stand upon it, like an upright cylinder open at the opposite end. Into this end he inserts his right index finger, and folding the paper round it he withdraws it, causing the end to retain the creases into which it falls. He then bends down the folded-in flap, and undoes the end upon which the packet was standing, which now goes through the same process as the right end, after shaking down the contents and making the surface even. Practice only will enable the dispenser to fold a packet in this way, as it is impossible to clearly describe it in a book. The little time lost will be amply repaid by the education which the fingers receive.

If more than one powder is ordered, the dispenser proceeds in a different way. Suppose, for example, twelve five-grain Dover's powders are to be dispensed, two ways are open to proceed. First, spread twelve papers out on the dispensing counter in four rows of three each. Weigh 5 grains, and place them on each paper till the dozen powders are weighed out. Then begin to fold one after another till all are finished. This is a tedious plan, for which the expert and experienced dispenser sometimes substitutes the following:—Weigh 60 grains, place it on the centre paper, and divide the heap with a knife into twelve portions. now adding a little to one and taking some from another, till the *eye* is satisfied that all are about equal; or, till a little practice is obtained in this method, weigh out 30 grains and divide into six papers. It is surprising how the eye so soon becomes educated to discriminate small differences in the size of the powders. This method, however, is not applicable to large powders, and should only be practised after very considerable experience of weighing; the writer cannot recommend it, especially to the student.

Ordinarily, in prescribing powders, the medical man writes the form as if for one powder, and then directs say twelve such

to be sent; hence twelve times the quantity of each substance is weighed and put into the mortar, generally in the order in which it is prescribed, for as a rule, it matters little in what order the ingredients are mixed, provided they have been previously in a state of fine powder; but if a very small quantity of an active ingredient be ordered, it should first be put into the mortar with about twice its bulk of some of the more inert ingredients; and after careful trituration, using the pestle as shown in Fig. 7, the remaining substances are gradually added. The mass of the powder should not be divided until the most thorough mixture has been accomplished.

Sometimes the physician orders a certain weight of the different ingredients to be mixed and *divided* into a number of powders. Here the dispenser might make a terrible mistake if he multiplied the quantity by the number of powders instead of dividing, and he should be always on his guard against such an accident. Substances are sometimes ordered to be dispensed in this form that are perishable, as ergot; or volatile, as camphor; or deliquescent, as carbonate of potassium; or liable to chemical decomposition, as sulphide of calcium, or the valerianates; in which case they should be folded up in the ordinary paper first, or, preferably, in waxed paper, and then each one covered with tinfoil, and sent out in packets of 4 or 6, which are again covered with an extra piece of the foil, and if to be kept for any time they should be enclosed in a wide mouthed bottle.

Sometimes a powder like Gregory's, ginger, soda, rhubarb, &c., is prescribed in quantity, with directions for a teaspoonful or other dose; or powdered borax is prescribed for injecting. In such cases the dispenser should send it to the patient in a wide-mouthed bottle, well corked, or even in some instances with a glass stopper.

When as many as six or eight small powders are ordered they should always be folded exactly of the same length on a folder, and sent in a cardboard box. Numbers under this are generally dispensed in small oblong envelopes, made for the purpose, and on which the directions can be written like the address on any ordinary letter. If sent in a box or bottle, a small label is gummed on the outside.

CHAPTER V.

COMPOUNDING AND DISPENSING OF PILLS.



Fig. 11.

THIS is perhaps the most difficult work of the dispenser, from the complexity of the process through which the mass has to pass before the finished pills are in a proper condition to be presented to the patient, and partly also because he is often left completely to his own resources, to unite in a pilular form ingredients unsuitable and without any cohesive property. Pills should be perfectly spherical, and should not be larger than can be readily swallowed without chewing; each should not exceed 5 grains in weight, unless the ingredients are exceptionally heavy—as calomel, bismuth, reduced iron, blue mass, &c.—when 8, 9, or even 12 grains may be with skill compounded in a fair sized pill; on

the other hand, as many as 5 grains of a light vegetable powder will be sure to make too bulky a pill, as the weight of the excipient or material added to give body must be taken into account. The choice of the excipient is often left to the dispenser, and some experience is necessary to guide him in his selection. The most common are: gum or mucilage, soap, syrup, spirit, or some soft extract, as gentian, inert in very small doses.

Mucilage, the most commonly used excipient, is well adapted to make vegetable powders into pills, but, as a rule, its use should be restricted to pills that are soon to be consumed—otherwise they will get very hard and insoluble. For mineral powders it is not so suitable, as the pills made in this way are apt to flatten, or "go down," as it is technically called.

Tragacanth is a very good excipient; it is especially so when added in powder to masses which are already too soft, as it gives body and elasticity; but if used too freely, the pills retain the cylindrical form, and after a short time may lose all traces of rotundity; tragacanth and water give good consistence to substances like nitrate of bismuth.

Honey and Treacle are used in preference to mucilage, as they make nearly as good a body, but with less risk of becoming hard.

Syrup is used for the same purpose when very little room is left for the excipient, but it makes crumbly masses with metallic salts.

Soap makes an excellent pill when added to resinous substances; it does not get hard, and is not apt to crumble, unless a substance like sulphate of iron is added.

Sawdust finely sifted has been highly recommended as an excipient to give toughness to soft masses, by Mr. Proctor; it imparts great retentiveness of shape, with little increase in size.

Glucose has been recommended by Mr. Lascheid.

Spirit is used in working up resinous substances; it is, however, very difficult to work with, as there is great danger of adding too much, which causes the mass to "drop," and if too little be added no effect is produced at all.

Decoction of Aloes.—A few drops of this liquid make a workable mass with aloes and gum resins, care being taken to add very little.

Kaolin is of great use in making a mass with substances which ordinary excipients decompose, as Pot. Permang., Argent. Nit., &c.

Liquorice and **Marshmallow** in powder give elasticity to soft masses.

Glycerine in very minute quantity occasionally assists dry crumbly masses; it is treacherously hygroscopic.

Wax melted or in shavings makes a beautiful mass with creasote, camphor, carbolic acid, and most essential oils; it may, however, make an indigestible pill.

Water is a dangerous excipient to use except in cases where a powdered gum is present, as it forms a brittle mass liable to flatten.

Bread-crumb for croton oil and carbolic acid, **Basilicon Ointment** for the scale preparations, **Confection of Roses** for vegetable powders, are deservedly little used now.

Calcium Phosphate is recommended in small quantities to give pilular consistence to greasy substances.

The dispenser will see that he has a long list of excipients, but a little experience will soon teach him that when he gets to *know* an excipient he can do almost anything with it; and most pill-makers have their favourite.

Proctor's Paste.—The writer, in recommending an excipient for *general purposes*, believes that none can be found equal to a paste made of

Powdered Tragacanth, 1 dram;
Glycerine, 3½ drams;
Water, 1 dram.

It improves by keeping; the inexperienced dispenser will be amazed how little of this substance will be sufficient to give consistency, toughness, and retentiveness to the most unpromising mass.

The dispenser having read over the prescription, and thought of the excipient which he will use, if such is not already directed by the physician, proceeds now to weigh the different ingredients, taking the substances that require pulverisation first; when all the dry ones are thoroughly mixed, the soft extracts are added, and the mass worked up in a mortar.

The proper mortar is figured at the beginning of this chapter. It is very shallow, there being one mortar or shallow depression generally in each end of it; it should be of unpolished wedgwood ware, and very thick, with a small pestle—which

is to be worked in a totally different way from any yet mentioned—the pestle being used as a lever, with the edge of the mortar next the operator as a fulcrum; and great force is necessarily applied, by which the substance is squeezed between the end of the pestle and the side of the mortar at each stroke, the mortar being firmly grasped by the left hand and turned round occasionally, so that all parts of the pill mass are exposed to the action of the pestle. It will thus be seen that the process is one of squeezing or kneading rather than pounding.

The student will do well to review at this place the different methods of using the mortar and pestle, as required for different results, and a little reflection will teach him more than a year's blind practice, for unless he has some idea of the scientific action of the machine, he can scarcely chance to wield the pestle efficiently or gracefully. It is used in at least four different ways:—1.—(As shown in Fig. 6.)—The pestle is grasped firmly, the wrist and elbow joints kept almost rigid, while the pestle is made to traverse the sides and bottom of the mortar, all the motion being at the *shoulder* joint (circumduction). 2.—The pestle is grasped in the same way, the wrist and shoulder joints are fixed, while the fore arm is raised and lowered alternately—as a gold-beater uses his mallet—all the motion being confined to the *elbow* joint (Fig. 6). 3.—The pestle is grasped like a pen, and with a light, quick, easy motion at the *wrist* it sweeps round the inside of the mortar (Fig. 7). 4.—The pestle is grasped by the fingers, the expanded end of the handle being firmly planted against the centre of the palm, its middle resting against the inside edge of the mortar, when the three previous movements are executed, and the pestle is driven slowly and forcibly against the opposite side of the mortar—the pill mass being between—here *shoulder*, *elbow*, and *wrist* are vigorously in motion (Fig. 11.)

The ingredients being worked into a uniform stiff mass in the mortar, are to be scraped out with a small spatula, and it is a good plan to work the mass for a few minutes between the fingers, which softens and toughens it. It is next rolled into a ball or cylinder with the finger and thumb, and transferred to the marble slab of the pill machine, on which is dusted a little finely powdered chalk, starch, or lycopodium; the back of the handle of the machine is used to roll it into a long cylindrical form, great care being required to prevent the cylinder tapering out thin at either end; a very light and quick motion backwards and forwards will prevent this—the handle being held perfectly horizontal, as shown in the sketch (Fig. 12), and each hand bearing an equal weight on the mass as it is

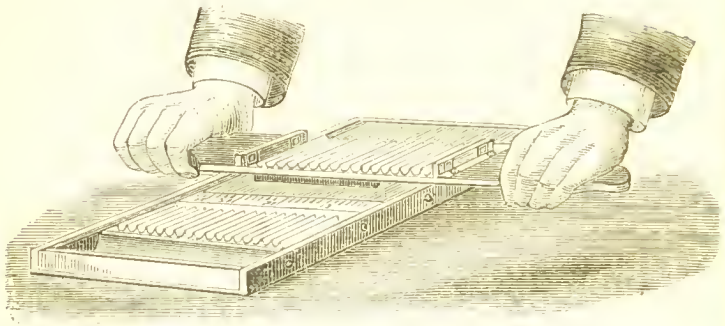


Fig. 12.

rolled backwards and forwards over the slab. It is brought from time to time alongside the scale, and when the number of pills into which it is to be divided corresponds with the number marked there, it is gently lifted or rolled with the fingers on to the grooved part of the machine: the handle, with its grooved surface downwards, is laid on it, and by a series of rapid and short movements, with both hands, abruptly brought to a close by pushing the handle from the dispenser, at the same time turning it on its own axis in his hands, the cylinder is cut and rounded into globular pills, which, with the last motion, are pushed into the box or tray at the end of the machine. If the operation is successful, and the mass of good consistence, no

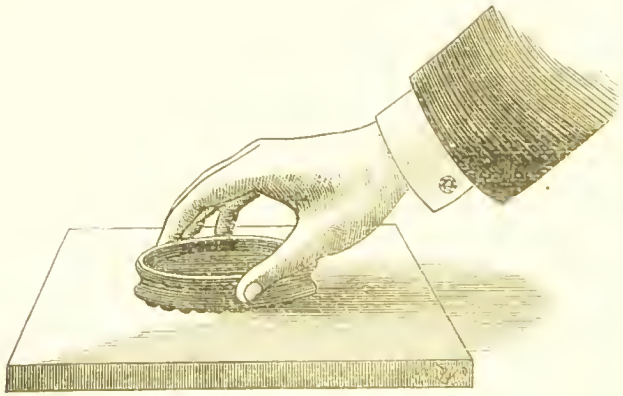


Fig. 13.

further handling will be necessary; but generally the track of the machine will be visible in each pill, and another process is required before the smooth globular form is perfect. The pills are again placed on the dusted slab, and covered with a pill-finisher—which is only a circular shallow boxwood tray, not so deep as the pills—and by a series of rapid rotatory movements the traces of the machine are dispelled, and a more spherical and polished appearance is given. (Fig 13.)

If the pills are very soft this cannot be successfully done, but they must be rounded separately between the finger and thumb.

There is another and more convenient method of making pills in small quantities; it is by means of the graduated tile and a spatula. The ingredients are weighed and placed on the tile—which is of porcelain or wedgwood ware, with very little glaze on its surface.

With the square end of a stout spatula, technically called a spud, the mass is worked into a uniform consistence, and, after a little kneading with the fingers, it is rolled out between the blade of the knife and the dusted slab, brought to the scale and cut into pieces, which are rounded into pills between the thumb and next two fingers of each hand. Figure 14 shows the rolling out process. Or the mass may be made in the pill mortar, and transferred to the tile, where it can be rolled out and cut.

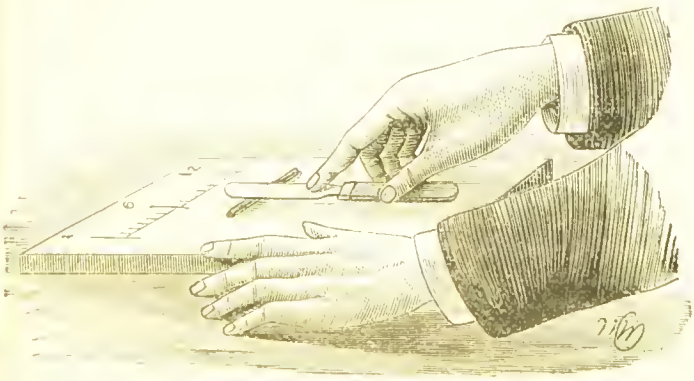


Fig. 14.

By submitting the tile to a uniform heat—viz., by immersing in hot or boiling water and rapidly drying, hard masses which could not be otherwise brought into the pilular form, can be easily softened by kneading between the end of the spatula

and the heated slab. In this way also small quantities of soft extracts can be dried or hardened by being spread out in a thin film on the *warm* slab, but great care is required lest the active principle of the extract be injured by the heat and exposure. Some pharmacists prefer a tile made entirely of metal.

Machines are now made on the cylindrical roller principle, by which as many pills can be prepared in an hour as the old-fashioned machine could turn out in a day, but they are only useful where very large quantities are to be rolled out at once.

The pills having been prepared as described, should be left out to dry (unless urgently required), either on the slab of the pill machine, or in some dry and warm place, whilst the label is being written and the box prepared in which they are to be dispensed. The box should be large enough to hold them in a single layer, otherwise they will be liable to stick or become flattened. Pills containing volatile ingredients should be always dispensed in a bottle, of which there are many kinds manufactured for the purpose with wide mouths. Some powder must be put into the box or bottle to prevent them adhering to each other or to the vessel, and different dispensers are in the habit of using different powders for the purpose. Chalk, lycopodium, flour, liquoriee, &c., are used; powdered French chalk will probably be found to be the most elegant and efficient.

CHAPTER VI.

PILL MAKING.—*Continued.*

THE coating of pills has seen many changes of fashion, and doubtless will, but it is questionable if ever a more satisfactory method will be introduced than the old-fashioned plan of covering the pill with a thin layer of silver leaf. To do this properly requires some neatness and care. The following directions, if followed, will give a successful result:—There should be no trace of powder about pills intended to be silvered. The silver leaf as it lies flat in the book in which it is originally supplied by the manufacturer, is exposed, and each pill is rolled between the thumb and the next two fingers which have been previously rubbed against a little mucilage

dropped on the slab of the pill machine, and when a sticky layer is felt to be imparted to the pill, without being so abundant as to drop off or run, it is allowed to fall on the silver leaf, and another treated in the same way, until twelve or fifteen pills are dropped at equal distances apart on a single leaf.

The silver leaf with the pills on it is allowed to quickly slide off the book into a spherical, or egg-shaped, boxwood vessel, which is to be shaken cautiously, the hand containing the box being turned round, making a circle in the air, for about one minute, so as to cause the pills to run round its inside, when an even and lustrous coating of metallic silver will be seen adhering to and completely covering each pill. Any loose fragments of leaf can be blown away, and after a short exposure to the air on the slab, the pills may be enclosed in the bottle or box in which they are to reach the patient. Gold may be applied in the same way. Pills containing blue mass in any considerable proportion should not be silvered, the mercury making an unsightly amalgam with the silver leaf. Asafœtida, when coated, turns the silver black, and consequently gold should be used.

Sugar will give a pleasing coating; its success, however, requires much practice. If the pills be covered with a film of mucilage, syrup, or gelatine, and turned into a circular box containing finely powdered sugar and starch in equal quantities, brisk circular movement for a few minutes is all that is necessary; the addition of a little finely powdered tragacanth to the starch and sugar gives a more elegant finish.

Pills are sometimes coated with gelatine, which makes a coating that is both soluble and looks well. A strong solution is made by heating one part of gelatine with two of water, and each pill, stuck upon the end of a fine needle, is dipped into the solution, the other end of the needle being thrust into moist sand till the gelatine sets, when the needle is withdrawn, and its mark closed with a little fresh gelatine.

Pearl Coating.—A new process is rapidly coming into favour of coating pills with albumen. It can only be satisfactorily carried out when the pills are very hard and firm. Each pill is rolled between the finger and thumb with a little egg albumen, and afterwards rotated till dry in a warm pill-tray or cup; or after receiving the coating of albumen they may be thrown into a tray with powdered French chalk or sugar, or a mixture of both these substances, and rapidly rotated till a perfectly smooth and glistening surface is obtained. The superfluous powder should be removed, and the rotation continued till a high polish results.

Collodion, sandarach or mastich varnish made with ether, may be used to give a smooth surface to well finished pills by dipping each pill, fastened upon the point of a fine needle, into either of these liquids. The pills must be very dry before immersion.

A **Bolus** is sometimes ordered in a prescription, as 10 grs. of quinine may be prescribed by the physician, with directions for the dispenser to make it into a "bolus," with honey, treacle, syrup, or any thick fluid. In England such a dose is sent out to the patient in one large, firm pill; but often in Ireland, and elsewhere, the pharmacist adds a sufficient quantity of the liquid substance to make a soft paste, like a confection or linctus, which he encloses in a piece of waxed or oiled paper, folded like a powder, with directions that it is to be scraped off with a spoon, and bolted or swallowed like jam. It is at the best an inelegant and often disgusting form of administering medicine. The ordinary wafer papers, sold in circular boxes, afford an easy, elegant, and inviting method to the patient whereby he can swallow the most nauseous powders, pills, or boluses, without tasting them. The wafers are composed of flour and water, which become limp when wetted, and they can be readily wrapped around the nauseous morsel and swallowed easily.

The student will often be puzzled in compounding pills, especially as no rules can be laid down for his guidance in selecting an excipient for every case. The following are a few of the difficulties, and their solutions, which he may often meet:

Strychnine or other powerful alkaloid is ordered in minute quantity, say $\frac{1}{32}$ grain. It should be rubbed up with a little sugar of milk crystals to fine powder, and after the addition of about $\frac{1}{4}$ gr. of liquorice powder, Proctor's paste, extract of gentian or mucilage, will make a mass. The dispenser should have a rule of *making the weight of such pills up to 1 grain each.*

Aloes in any quantity in a mass is best made up on a heated slab with proof spirit or decoction of aloes in *minute* quantity.

Butyl Chloral Hydrate should not be treated with the tragacanth paste, which dissolves it and causes the pills to flatten. It is best worked up with a little confection of hips and thick mucilage.

Croton Oil makes a good mass with powdered liquorice and mucilage or with bread crumb.

Extracts, when ordered without any powdered or dry substances, can be made into pills with gentian or liquorice powder.

Gallic Acid 5 grs. (in fine powder) and glycerine ½ drop make a good pill.

Iodide of Potassium should be rubbed up with a few drops of water into a smooth paste, and made into a mass with a little liquorice powder; 6 grs. may thus be got into a fair sized pill. The proportions of liquoriee and water will depend upon the sample of iodide, as this salt varies much in its suitability for making pill masses.

Phosphorus should be dissolved in bisulphide of carbon, and whilst solution is being effected two or three drops of chloroform may be added, which produce a heavy vapour around the solution and prevent oxidation of the phosphorus by the atmospheric oxygen. A little liquorice powder is now added, and the mass quickly made into a workable form with Proctor's paste, divided into pills and varnished.

Quinine 4 parts, tartaric acid 1 part, with q.s. of Proctor's paste, make an excellent mass, much less liable to crumble and of less bulk than if the acid be omitted.

Acetate of Potassium will remain stable when worked into a mass with Canada balsam.

Blaud's Pills.—A commonly ordered pill is one containing 2½ grs. each of sulphate of iron and carbonate of potassium; a little soft paraffin and cacao butter will form a good mass without encouraging chemical action; or the salts can be rubbed together and allowed to stand for half an hour, when a soft paste results which can be made into a mass with tragacanth powder and a drop of water.

Camphor must be powdered with a few drops of spirit, and Proctor's paste added *after the spirit evaporates.*

Carbolic Acid may be easily made into a mass with wheaten flour 1½ grs. to 2 grs. of the crystallised acid, or with bread crumb, or with powdered marshmallow or elm bark, to which a trace of Proctor's paste is added.

Creasote is made into a mass by Martindale by adding animal soap, and heating on a water bath. Powdered liquorice, to which a few atoms of bees' wax are added, affords a plastic workable mass. If ordered in a pill with oxide of silver, creasote will explode unless the oxide be first diluted by trituration with some inert powder like liquorice or gentian.

Copaiba can be made into firm pills with a little carbonate of magnesium. They soon become insoluble.

Citrate of Iron and Quinine can be worked up with Proctor's paste, but soon deliquesces. A little Canada balsam is better.

Calcium Sulphide, now much ordered for acne, should be mixed with an equal quantity of sugar of milk, and, after careful trituration, as much powdered decorticated liquorice root added as will make the weight up to say a grain. The mass can now be worked easily with a little tragacanth paste. Sugar of milk makes the best powder to aid the subdivision of an active substance, and the powdered decorticated root of liquorice is the best inert powder for making up pill masses, as it is so fine and impalpable that it does not make a crumbly pill like powdered gentian.

Rhubarb Powder makes an elegant mass with $\frac{1}{5}$th its weight of glycerine.

Tannic Acid can be manipulated with $\frac{1}{5}$th its weight of glycerine and about $\frac{1}{10}$th part of mucilage.

Permanganate of Potassium, is commonly ordered in a pill, and requires much care at the hands of the dispenser, as it yields oxygen in contact with organic matter; it may be finely powdered and made into a mass with cacao butter and a little soft paraffin. Resin ointment makes also a good mass. Martindale advocates an excipient of soft paraffin, hard paraffin, and kaolin, whilst Proctor only uses kaolin and a little water.

Mr. Ince has contributed to the *Pharmaceutical Journal* in June last one of the best articles ever written on Pill Making. Every student of pharmacy should peruse it.

CHAPTER VII.

THE COMPOUNDING AND DISPENSING OF OINTMENTS.

THE making of an ointment is generally a very simple matter, only requiring perseverance and painstaking, which always repay the dispenser. It is often a matter of simple trituration; and a pestle and mortar, with a spatula, are all the implements required. Rarely, if ever, will the extemporaneous ointments ordered by the physician require any melting.

If two ointments, or an ointment and a liquid or oil, are ordered to be mixed, the simplest method of procedure is to weigh and measure the ingredients out on a porcelain slab, and thoroughly blend them with a long spatula. This will answer in many instances, but the dispenser is cautioned against making extracts, powders, or gritty substances into an ointment in this way.

In such cases the substance to be incorporated with the fatty or oily basis is put into a mortar and ground with some minute quantity of excipient to the finest conceivable state of subdivision, and by far the best excipient ever devised is a little of the old-fashioned "elbow grease." The pestle should be worked as shown in Fig. 6, and the mortar should be capable of holding very many times more of the ointment than is about to be made. When the powder, or extract, or crystal is put into it, it is subjected to firm powdering or rubbing. A very little of the fatty basis is added, and trituration continued till a smooth, impalpable paste is obtained; then the remainder of the basis is added gradually, sweeping the sides of the mortar and pestle from time to time with a spatula, so that all is thoroughly mixed. Often, however, it will be necessary to add something to facilitate the grinding before adding the ointment: thus, if camphor is ordered, it must be rubbed very fine by the aid of a little spirit which evaporates during the mixing. If an extract is to be added to an ointment it is first put into the mortar and rubbed to absolute smoothness with a little spirit, water, or glycerine, before adding the unctuous basis. If the extract is hard, or even of pilular consistence, the best plan is to previously warm the mortar by pouring hot water into it, and dry quickly with a cloth, when the extract can be rubbed to smoothness before a little of the basis is added. Soluble crystals like iodide of potassium, or carbonates of potassium or sodium, are triturated with a little water before adding the remaining ingredients. Iodine should be rubbed to powder, a few drops of spirit added, and the trituration continued. Iodide of sulphur should be most perseveringly rubbed down with a little olive oil, borax with a little glycerine, and red precipitate with distilled water.

Volatile liquids should be added after the other ingredients are well mixed, so that evaporation is reduced to a minimum, as in the case of Prussic acid and chloroform.

Steel knives should not be used in the preparation of ointments with the alkaloids, or with acids, or especially with the acid nitrate of mercury, red precipitate, or yellow oxide of mercury ointments, which are ruined by the touch of iron. Many fine and pearly compounds made with cold cream are

well prepared by mixing them up in a china cup with a silver or gilded spoon, and it is a safe rule for the young dispenser to always use a bone or boxwood knife in making all ointments.

This is not intended as a complete list of the difficulties and their remedies in ointment making; but the writer has deemed it wise to enter more fully into the subject than its simplicity might apparently warrant, for just because the preparation of this class of compounds appears to be very easy, so are they often carelessly compounded, to the vexation of the physician and annoyance of the patient. It is not at all an uncommon thing to see sores irritated and eyes inflamed by the very remedies prescribed to soothe them, the coarse angular particles acting like so many little setons. It is hardly necessary to say that any ointment with the least trace of rancidity should not be compounded by the dispenser.

When the mixing has been finished the ointment is scraped out of the mortar with a bone or wooden spatula, and generally dispensed in covered porcelain pots, and unless of very firm consistence a piece of waxed paper should be inserted between the ointment and the lid and pared neatly round. If it is at all approaching the fluid state a wide-mouthed bottle will be the best vessel. Occasionally, for the poor and in hospital, the common chip box is used.

CHAPTER VIII.

COMPOUNDING OF SUPPOSITORIES AND PESSARIES.

Suppositories are seldom ordered except in the Pharmacopœial form; but, as even these should be prepared by the dispenser himself, a passing notice may be made of their preparation. They are generally made in conical moulds, should weigh about 15 grains each, having cacao butter for their basis, and such other firmer substance, to enable them to solidify rapidly after being poured into the moulds; this latter *desideratum* is assisted by having the moulds made of a massive block of gun-metal, which causes their rapid cooling (Fig. 15). The ingredients should be treated as if an ointment was to be

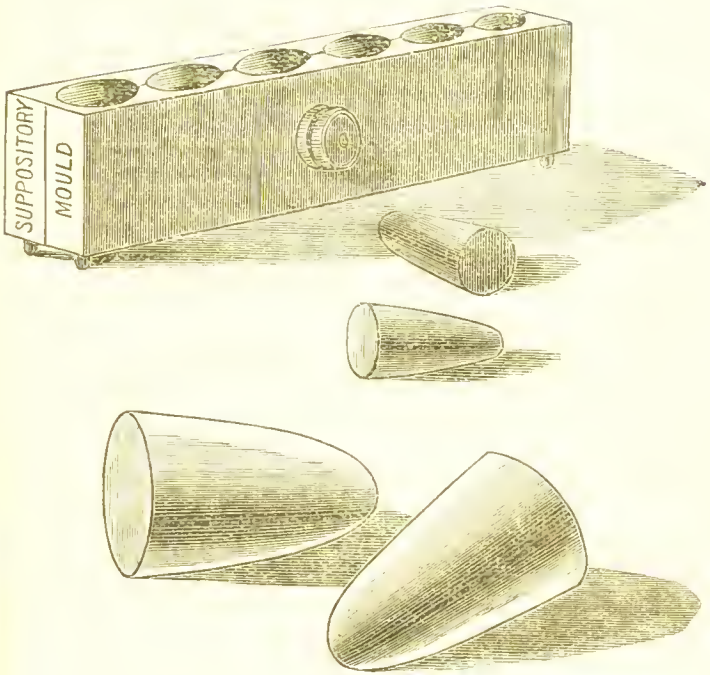


Fig. 15.

made; any powder or crystalline substance being rubbed to fineness with a little lard or a trace of the butter in a mortar or on a slab, whilst the remainder of it is being melted in a small cup on a water-bath with the wax; only enough heat must be used as should barely melt them, and when they begin to show signs of congealing the triturated ingredients may be added with a teaspoon, and stirred constantly till a creamy mass is obtained, which is to be poured into the moulds with the teaspoon. If the moulds are previously dipped in ice water, or in a little freezing mixture, made by dissolving sal ammoniac in water, the subsequent detachment of the congealed substance will be expedited. This latter part often gives trouble, the suppositories persistently adhering to the mould; various plans are tried, and the simplest would be to wet the interior of the mould with water, but water will generally run off it in drops; breathing into it often answers, or dusting over the surface with lycopodium and blowing out the

excess; but by far the best method is to smear over the interior with soap liniment. Spermaceti will be found a more satisfactory addition to the cacao butter than wax, as, owing to the rapidity of its congealing, the mass is not so liable to adhere; oil applied to the interior of the moulds is liable to cause the suppositories to stick fast.

Pessaries are made in precisely the same way, only they are from six to ten times larger (Fig. 15), generally weighing about two drams, and made in larger moulds of a similar shape. If a very small pessary is ordered, it may be made as two suppositories fused at their bases, forming a double cone—and this shape answers well when it has to be moulded by the fingers.

Both suppositories and pessaries should be dispensed in small square cardboard boxes, with cotton wool; or, in the absence of these, in large pill boxes; and the directions for their use should be plainly given by the physician, or written on the box by the dispenser—as sometimes in ignorance they are swallowed.

Pessaries and Suppositories, containing **Green Extracts,** may be readily made by first rubbing the extract with powdered Castile soap in the proportion of about one-fifth part of the bulk of the whole pessary or suppository, and supplying the remainder of the basis with coccine, when the mass can be worked up in a mortar like a pill, and shaped by the fingers or thrust into moulds previously dusted with powdered starch.

The *Chemist and Druggist Diary*, 1885, says :—"The chief points to be observed to insure successful manufacture of this useful form of preparation are—first, the complete incorporation of the medicinal ingredient as an impalpable powder with the melted mixture of cacao butter and spermaceti; second, the chilling of the melted mass to such a point that while it will flow from the cup or capsule it will not allow the rapid subsidence of the suspended powder; third, when using metallic moulds to have them so refrigerated in advance as to harden the suppositories almost immediately on contact."

CHAPTER IX.

DISPENSING OF BLISTERS AND PLASTERS.

BLISTERS are generally spread upon adhesive plaster. In the case of public charitable institutions, they may be spread upon brown paper; but, unless directed otherwise, they should be always put upon the adhesive plaster which is itself spread upon thin glazed calico, and sold in rolls of a yard each. The twilled calico, swansdown, and other fabrics, as a rule, are not so suitable. The dispenser takes the size of the required

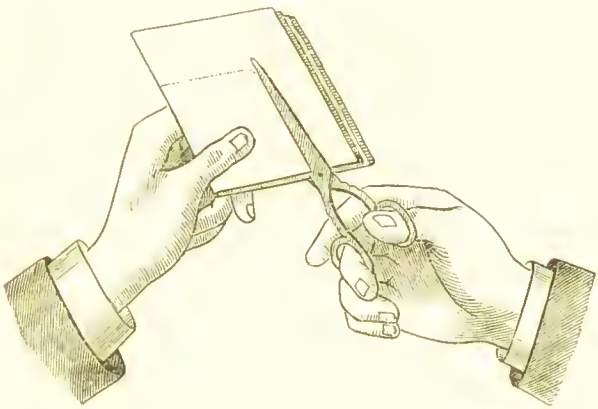


Fig. 16.

blister, which is commonly oval or square, and prepares a "shape" by folding a square piece of waste writing or wrapping paper twice upon itself, and with a pair of scissors he cuts the form and size of the blister out of the middle of this, rejecting the cut out centre (Fig. 16).

He has now an exact shape (Fig. 17), the inner margin or edge of which is the same size and form as the circumference of the required blister. (This is precisely the same manner in which plaster shapes are made.) A piece of the thin sheet of

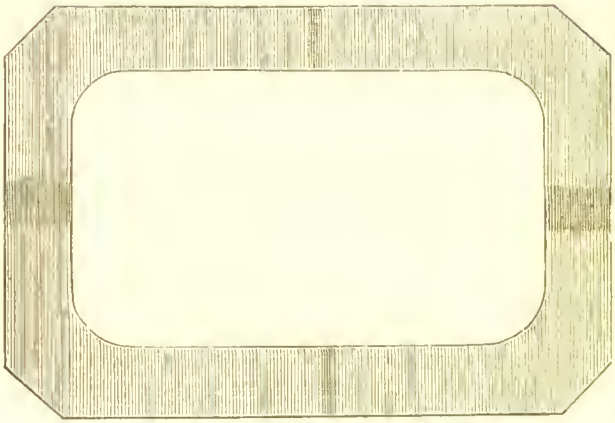


Fig. 17.

adhesive plaster is cut about one inch larger than the blister, and gently warmed, only enough heat being used to make it *slightly* sticky ; it is then quickly laid upon some firm smooth surface, and the shape pressed upon the adhesive side—where it should evenly adhere, but only in such a way that it readily separates when pulled off. All is now ready for the spreading process, which should be accomplished by the thumb alone ; the cantharides plaster of the Pharmacopœia is well adapted for this ; a piece about the size required is kneaded between the fingers until *uniformly* softened throughout, when the dispenser, steadying the shape and plaster with the fingers of his left hand, spreads a piece about the size of a bean with the side and front of the last joint of the right thumb, beginning at the corner next him and continuing in a series of rainbow strokes till the plaster is covered. This is well shown in Fig. 18.

A long spatula, not unlike a dinner-knife, warmed only to such an extent that its temperature can be borne by the skin when pressed against the cheek, should now be firmly passed over the blister, removing superfluous plaster and making its surface smooth and even. Some dispensers previously sprinkle a few drops of blistering liquid, or olive oil, over it to improve its appearance—but this is not necessary. The paper shape is now peeled off the plaster and the edges trimmed neatly with a *large* pair of scissors, allowing a margin of plaster about three-eighths of an inch wide to remain ; a piece of waxed or

oiled paper is laid on its surface, and the whole enclosed in a paper box or envelope. The dispenser or physician should be careful to direct that this paper be removed before application, as the writer has known several instances where blisters and plasters have been rejected as useless, the paper never having been removed. Instead of cutting the piece of plaster for the blister off the roll, the experienced spreader may lay the shape on the roll itself, thus saving the clippings, as shown in the Figure.

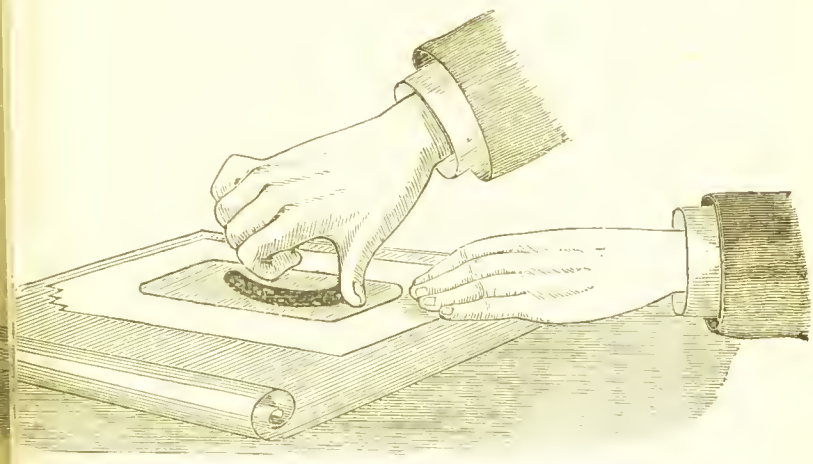


Fig. 18.

Plasters are more difficult to spread, since they require heat, and they are often liable to be burned, creased, or uneven; and the dispenser who can spread a plaster properly will be always found to be one who can perform every other duty of the art of compounding satisfactorily; hence it may be looked upon as the test of pharmaceutical accomplishment to be able to perform this operation neatly and excellently. Plasters are generally spread upon sheep skin or stiff chamois, and sometimes over adhesive plaster which has been already spread upon linen, dimity, or moleskin; but when the physician simply orders a plaster without specifying the fabric upon which it is to be spread, he means it to be dispensed on the white sheep skin which is kept by every dispenser. The same steps are gone through exactly in cutting the shape as if for making a blister; a piece of leather somewhat larger than the

size of the intended plaster is eut off the skin, and pulled in different direetions gently, to make sure that it will not yield too mueh when the weight of the iron goes on it; the leather is next laid on some soft even surfaee; a few quires of wrapping paper laid on the dispensing eounter answer very well. The plaster iron, which should not be too large, is now *slightly* warmed over a gas stove or in the fire, wiped elean, and passed over the surfaee of the leather, so as to remove every wrinkle and inequality; the shape laid on the eounter is moistened on one surfaee with a little damp tow or sponge. The addition of some soap to the water in whieh the sponge or tow is wetted is a praetical point worth remembering, or a little flour paste may be employed. The shape is now plaeed upon the *rough* side of the leather, and pressed carefully and evenly with the palm of the hand near the wrist, until it adheres at every point to the leather, when it is ready for spreading.

The different plasters are kept in eylindrieal rolls, and are melted as required, by means of the plaster iron, on the heating of whieh the sueeess of the operation depends; it should be

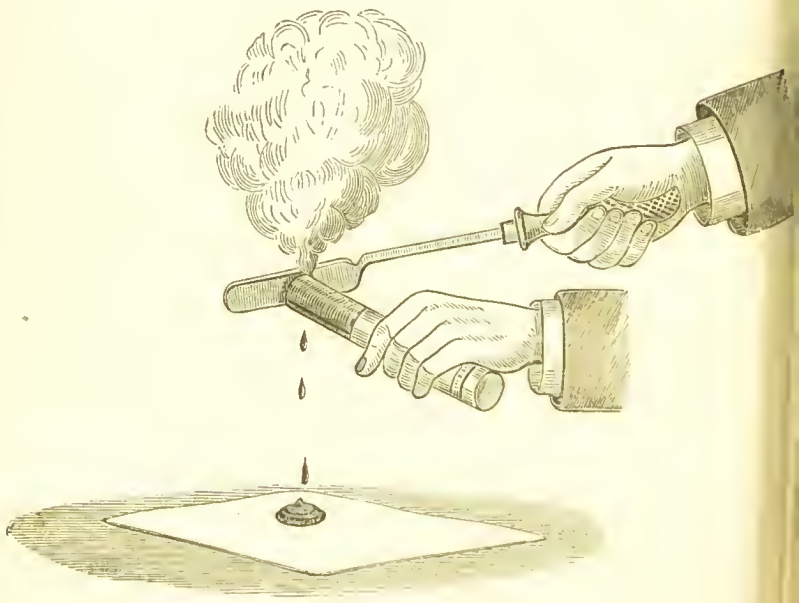


Fig. 19.

warm enough to readily melt the plaster, without spoiling the leather; its heat may be judged by pressing it against a clipping from the sheep skin, which will brown and curl up if too hot.

When the plaster iron is over-heated, a film forms on its surface, and often small particles of carbon adhere to it, which, coming off during the spreading, spoil the appearance of the plaster. To guard against this, the iron, after coming out of the fire, should be briskly rubbed against some soft solid substance, as a piece of wood or coarse cloth. Irons are now made which can be heated by allowing gas jets to burn in their interior, and thus there is no limit to the amount of work which one iron can accomplish without interrupting the operation.

The iron then being heated to the right degree, its flat face is pressed against the end of the roll of plaster with a slight circular movement, and the liquid plaster which drops down is caught upon a piece of strong, smooth brown paper, as

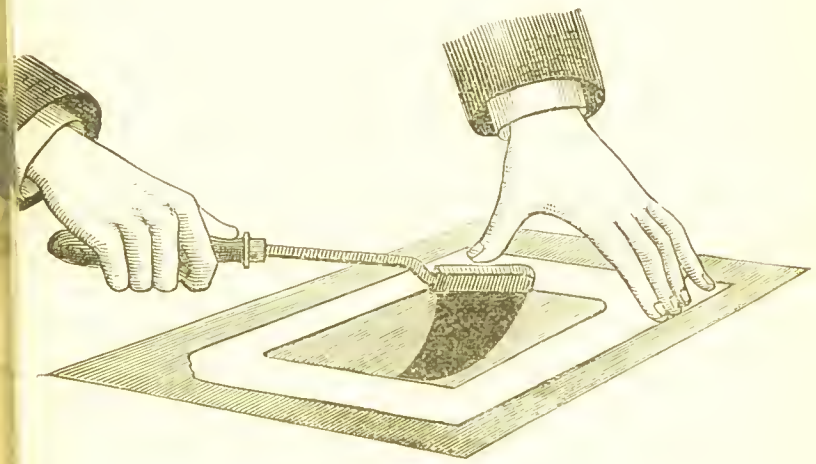


Fig. 20.

shown in Figure 19. If two or more varieties of plaster are ordered in combination, it is at this stage that they are melted together against the *face* of the iron, and mixed with its sharp *edge* on the paper; and, when a thoroughly uniform creamy mass is obtained, it is scraped along the surface of the paper to near its margin. The leather, with the shape attached, is now

brought alongside, when a few strokes with the near edge and adjoining part of the face of the iron will spread the plaster over the surface of the leather, beginning at the edge next the operator and sweeping round the far margin in a series of half ovals, watching the borders and corners, "for the centre will take care of itself." (Fig. 20.) Towards the end, when the leather is covered, the flat face of the iron may be used to smooth all irregularities; and, after a moment's delay, during which the plaster hardens, the shape may be pulled off, and the border of the leather trimmed; in a medium sized plaster at least three-quarters of an inch of border should be left. One iron will not do all this; and before beginning two should be selected; the second may come into use about the time the plaster is being transferred from the paper to the leather. If the plaster were melted directly on to the leather, as some advise, a mess would probably be the result.

Sometimes a plaster is ordered to be spread on leather with an *adhesive* margin, and it is a more troublesome process than the above. It may be done in this way:—The shape is cut as described, and the centre piece, instead of being thrown aside, is damped, and pressed against the middle of the leather; the shape is taken, folded up again, and a piece cut out of it for the entire extent of its inner margin—thus enlarging it by the width of the intended adhesive margin; it is then stuck to the leather, leaving a space between its inner margin and the central piece of paper, which space is to be spread over with adhesive plaster, both papers pulled off, and the vacant central part covered over with the plaster as ordered; the edge trimmed, the surface loosely covered with a piece of waxed paper, and dispensed in a flat paper box. The dispenser, until he has acquired great practice at spreading plasters, will be unable to finish the inside space without a shape; and he may achieve all that is required in this way:—The leather to be covered with plaster is laid down flat as before, and, with one good circular sweep of a large iron, its circumference is surrounded with a margin of adhesive or resin plaster; when this is cold, the shape, cut as before to the exact size of the plaster required, is laid down on the leather and attached, by means of a little soft soap, to the adhesive marginal surface. The plaster, having been mixed as previously directed on a separate bit of paper, is rapidly spread, as if there were no adhesive margin in the case, the shape is now torn off, and the adhesive border trimmed. The student will observe that if these directions are followed he will have no plain margin outside the adhesive one, and seldom is such deemed necessary, so that this latter method is, on the whole, the better one for him to learn.

CHAPTER X.

GENERAL HINTS TO THE DISPENSER.

In our limited space we can only give a very few additional hints to the student of Pharmacy upon such matters as do not naturally fall under the previous chapters. It is hardly necessary here to remind the student of Pharmacy that upon his simplest manipulations hangs the life of the patient, and though this solemn sense of his responsibility should be ever before his mind, it should not be allowed to paralyse his exertions, or tend to render him "unpractical." Over-confidence is a fruitful source of mistakes in Pharmacy, as it is in other departments, and the pharmacist must be cautioned against falling into the habit of working mechanically or automatically, so common amongst the absent-minded. It is a frequent occurrence, for example, to see a dispenser walk in an automatic way up to a well remembered place where a bottle has always stood, lift it from its shelf, and pour out its contents without looking at the label. If the student should find himself falling into this habit, his remedy is to occasionally remove the bottles and occupy their places with others unmistakably different in shape and size.

Artificial Waters should not be employed, as they are wanting in the fragrance of the distilled preparations.

Solutions.—As quickness and despatch are generally considerations in Pharmacy, it is advisable to keep some of the more frequently prescribed salts in solution; and a few hints as to the most convenient strengths of these solutions may not be out of place here.

Alum, 2½ ozs. (Troy) dissolves in 1 quart of distilled water; each ounce of the solution representing half a dram of the salt.

Bicarbonate of Potassium, 1 ounce (Troy) dissolved in enough distilled water to measure 4 ounces, makes a very suitable stock solution, as half an ounce of it contains one dram, or 60 grs. of the salt.

Chlorate of Potassium, 1 in 24, made in the same way, is the best strength to suit all variations of temperature. The salt is soluble in a smaller quantity of water, but is apt to crystallise with changes of temperature.

Epsom Salt, 1 in 2; **Bromide of Potassium,** 1 in 3; and **Chloral Hydrate,** 1 in 1, make very convenient solutions, the latter particularly so, as each minim represents one grain of chloral, and it is fairly stable and easily calculated.

Official Pill Masses.—Some of the official pill masses become very hard on keeping, and get so brittle as to be unmanageable; they may, with great advantage, be kept in the dry state, the powdered ingredients being mixed together, so that the menstruum ordered in the Pharmacopœia to give consistence may be added at the time of dispensing. In this way Pil. Colocy. Co., Pil. Aloes Barb., and Socot., Pil. Aloes et Ferri, and Pil. Hyd. Subchlor. Co. may be kept with the required proportions of the requisite menstruum marked on the bottles in which they are contained. This plan is often a great help if the physician happens to order too soft a mass.

Mistura Ferri Co. can also be kept in a concentrated form, so that every dram will contain the constituents of an ounce of the mixture, except the sulphate of iron, which is to be weighed out and added the last thing before dispensing.

Mist. Cretæ can be easily kept in powder, ready for the addition of cinnamon water.

Concentrated Infusions and Decoctions, so often employed by pharmacists for convenience, are to be condemned. *These preparations should always be made fresh as required.*

Substitution.—It cannot be too strongly impressed upon the student's mind that substitution should never be practised. By substitution is meant the using of an equivalent quantity of one preparation of a drug for that of another; say for instance, infusion of cinchona is required, it would be absolutely wrong to use an equivalent quantity of the liquid extract, as it is more than probable that this latter preparation does not contain the full quantity of alkaloids that an equivalent quantity of bark in the infusion does. The student of Pharmacy never should depart from the strict observance of the Pharmacopœia.

Unofficial Nomenclature.—Often the dispenser will be at a loss to understand the meaning of the prescriber, when he orders some preparations out of their official names, and he then must have a consultation, or fall back upon the experience of himself or others. A few examples may be given:—When Magnes. Calc. is ordered, Magnesia Ponderosa B.P. should be used; when Magnes. Carb. the *heavy* preparation is usually intended; when Bismuth,, or Bismuth. Alb. is prescribed, the subnitrate is the preparation generally in the mind of the physician; when Æther. Chlor. is ordered, it is best

not to dispense "chloric ether," but Spirit of Chloroform B.P.

Liq. Morphiæ is very often written in a prescription, and the dispenser will do well to employ Liq. Morph. Hydrochlor. When Extract. Aloes is written, the rule should be to use the Socotrine.

Much confusion unfortunately exists in the memory of some prescribers about the mercurial chlorides, and fatal consequences have resulted. The Subchloride is often written Hyd. Chlor., Hyd. Mur., Hyd. Submur., and the Perchloride is occasionally prescribed as Hyd. Chlor., or Hyd. Bichlor.

If the dispenser find it impossible to consult the physician in such cases, he will not regret giving the subchloride, if more than $\frac{1}{8}$ grain is ordered in each dose.

It will be well to remember that Hydrate of Chloral is sometimes carelessly written Hyd. Chlor.

Loose or Dry Ingredients.—When the physician orders salts, like Pot. Iod., or roots, like Gentian, with directions for their solution or infusion by the patient himself, the dispenser should destroy their identity by the pestle before sending them to the sick room. Quinine, for the same reason, if ordered in a mixture without a solvent, should be carefully triturated till the crystals are broken up.

Incompatibility.—When the pharmacist gets a prescription where incompatible substances are ordered it is clearly his duty to compound it, unless *absolutely* incompatible, in which case the different ingredients will not mix, and, if possible, then he should consult the prescriber. Instances of such might be given to fill a large volume, and, unfortunately, no rule can be laid down for the guidance of the young dispenser, as it is still an open question with pharmaceutical authorities whether a compounder is justified in altering a prescription, suppose he find the emulsifier or pill excipient ordered by a medical man unsuitable. Much will depend upon his knowledge of the prescriber; if he is satisfied that the incompatibility was known to him, it is clearly his best rule to follow the written law of the prescription, and carry out rigidly the intention of the prescriber. But if upon the other hand the chemical action (inevitable upon the mixing of the ingredients) was *evidently unintentional*, the dispenser will be justified in averting it by any means at his disposal. If the incompatibility produces such a change in the ingredients of the prescription as would probably risk the life of the patient, the dispenser should not compound it without a consultation.

Looking at the question from the physician's point of view, the writer thoroughly endorses Mr. Ince's opinion:—"We

have no right to expose a patient to the risk of imperfect combination, and here, as a dispenser, I would act upon my own responsibility. The interest of the physician is best served by the dispenser who is a sentient being, and not an automaton."

Poisonous Doses, or doses which may strike the dispenser as decidedly risky to the patient's life, should not be dispensed unless the dispenser happens to have some knowledge that such is within the prescriber's knowledge. If, for instance, the poisonous dose was *underlined*, *initialled*, &c., or as it is usual in Germany, followed by a note of exclamation, the dispenser can, without hesitation, send it to the patient.

We may conclude these necessarily brief suggestions on extemporaneous Pharmacy by quoting the following guiding rules for the Pharmaceutical student from the *Chemist and Druggist's Diary*, 1885. They epitomise the principles laid down in the foregoing chapters:—

"1. Read through a prescription, rapidly and in a manner suggesting no suspicion of doubt. 2. Write directions invariably before dispensing. 3. Avoid thus the use of blotting-paper. A good dispenser uses almost none. 4. If a mixture contains readily soluble ingredients, never use a mortar. Avoid effecting solution by heat, for fear of recrystallisation. 5. With syrups and also ingredients not water, arrange in dispensing to rinse out the measure and leave it clean. A skilled dispenser shows very little traces of his work. 6. Carefully clean and put away weights and scales after each operation. 7. Hold the scales firmly by the left hand, never lift them high above the counter, and judge of the weight as much by the indicator as by the position of the scale. 8. Select glass pans for scales, preferably of heavy make, and discard flimsy brass material, which corrodes speedily and becomes inaccurate. 9. Learn to judge of the quantity to be weighed with tolerable accuracy: train the eye as well as hand. 10. If in doubt, always begin with that in which you have no doubt. 11. Be rapid in manipulation. Finish wrapping, tying, or sealing quickly. Slow dispensing is bad dispensing, and arises either from deficient practice or want of knowledge. 12. Never, when in a shadow of doubt, hesitate to ask advice from a fear of compromising your own dignity."

CHAPTER XI.

OFFICIAL PHARMACY.

UNDER this heading are included *brief* descriptions of various processes mentioned in the directions for the preparation of several Pharmacopœial remedies. Many other processes are used by the pharmacist, but only the most important of those referred to directly in the last edition of the British Pharmacopœia will be noticed. The student will probably discover that many of these are but repetitions of processes already practised by him in the chemical laboratory—as precipitation, crystallisation, &c.; others, however, will be found to be peculiar to Pharmacy—as percolation, infusion, &c.; and it will be advisable for him, before entering upon the study of the various preparations, to glance at a few of these more important processes—especially to those that are common to many groups of preparations, as—

Affusion or Ablution—by which is meant the pouring of water on any substance to cleanse it of its impurities. In the washing of a precipitate, for example, the student is directed to pour cold or hot water upon it, shake or stir briskly, allow the insoluble part to fall to the bottom by rest, and then to pour or draw off the supernatant liquid. In the British Pharmacopœia these simple operations are respectively dignified by the names of

AFFUSION,
AGITATION.
SUBSIDENCE or DEPOSITION, and
DECANTATION.

Analysis.—In the Pharmacopœia both the *qualitative* and *quantitative* methods are frequently directed to be employed; and of the latter sometimes the *volumetric* and sometimes the *gravimetric* process is made use of.—(See "Testing.")

Baths.—Sand, water, and steam are mentioned under Fusion.

Boiling or **Decoction** is largely employed in the manufacture of various decoctions, extracts, syrups, &c. Generally the directions are, that the article to be decocted is to be put into a covered vessel with cold water, and allowed to boil on the

fire for a given time. If, say, a quart of water, with the substance in it, is to be boiled down to a given quantity, as a pint, then the decoction is a mixed method of boiling and concentrating by evaporation, and an uncovered vessel is selected; decoction of pomegranate is made in this way. The process of making extracts is quite different: here the evaporation or boiling is performed after the drug is separated from the original decoction, juice, or infusion. **Ebullition** is the ordinary chemical term for boiling, and is occasioned by the formation of bubbles of vapour within the liquid, which rise to the surface like gas bubbles. Decoction, strictly speaking, is the ebullition of a liquid containing some vegetable substance whose virtues are to be extracted by the boiling liquid.

Bruising or **Contusion** is a process by which soft, elastic, or ligneous substances have their structure broken up before being subjected to the action of a solvent by infusion or maceration. It is employed to break down the cohesion of fibrous roots, and is applicable to all tough drugs, like ergot, cloves, asafœtida, &c., and to fresh leaves and young juicy branches. The article to be bruised is put into an iron or strong stone mortar, and, with a straight up and down movement of the pestle, it is bruised, crushed, or pounded till the requisite degree of destruction of tissue is obtained; a little only being operated on at a time. The same object is often attained by cutting.

Calcination or **Incineration** is the process of exposing a substance to a high heat, so that water and volatile matters are driven off, or oxygen absorbed, and the residue left in a finely divided powdery condition. The process is carried on by placing the substance to be calcined in a Cornish, Hessian, or other crucible, which is placed in a furnace. In this manner the Pharmacopœia directs magnesia and lime to be prepared from their carbonates.

Clarification or **Depuration** is the purification of a substance, generally a liquid or semi-solid, by extracting its impurities, as in the case of honey, lard, suet, &c., by melting or heating, and, whilst fluid, straining through some texture like flannel. It is a modification of the process of filtration.

Crystallisation is the process which bodies undergo in passing from the liquid or gaseous state to assume definite and regular geometrical forms, called crystals. This process is generally directed to be carried out by the cooling or evaporation of a solution containing the substance to be crystallised, or more rarely it is ordered to be effected by fusion, as in the case of some metals and sulphur; by sublimation, as benzoic

acid and corrosive sublimate; or by precipitation, as in the instance of the red iodide of mercury. In obtaining crystals by evaporation the liquid is either boiled till its volume is reduced by the loss of vapour, or it may be kept at a lower temperature than the boiling point for a longer time till the same effect is produced, and when the concentration has proceeded so far that a scum or pellicle forms on its surface, the liquid is set aside to cool, and as the temperature falls crystals form. When they have ceased to grow or increase, the fluid part, which is now called the "mother liquor," is poured off, and the crystals drained and dried. A second or third crop may be obtained from the mother liquor by further evaporation and cooling, as in the first instance. The process is hastened by the presence of foreign bodies, as threads or sticks, round which the crystals quickly gather; or by agitation, when the crystals will be found to be small. The slower the process the larger and more regular will be the crystals, and it is advisable not to evaporate just so far as the Pharmacopœia directs usually for most of its salts. The six systems of crystals are all well represented in the Pharmacopœia.

In the case of some salts like alum, carbonate of sodium, and sulphate of iron, the water of crystallisation, which the salt carries down with it on assuming the solid form, is directed to be expelled by heat, thus increasing the strength of the substance by the weight of the water lost, which ranges generally from $\frac{1}{4}$ to $\frac{3}{4}$ of the original salt; thus dried sulphate of iron is nearly twice the strength of the crystals.

Decoloration—a process by which substances like the alkaloids Morphine, Atropine, &c., are deprived of colour—consists in treating a solution or mixture of the substance with powdered charcoal and filtering. Purified animal charcoal is directed to be used.

Despumation is the name given to the process by which many organic liquids are purified by the application of heat, when the impurity rises to the top as a scum, and is easily removed by skimming or by filtration. Though not directly mentioned under this name in the Pharmacopœia, this process is extensively employed, as in the making of the green extracts, and the practical pharmacist finds that the syrups made with organic liquids, like the majority of the official ones, keep much longer by being despumated. This is the more necessary as it is difficult to find sugar perfectly pure and free from organic adulteration.

Desiccation is the name given to the process of drying drugs.—(See under "Drying.")

Digestion is one of several allied processes often confounded. It means the prolonged treatment, at a heat elevated, but below the boiling point, of a substance (such as a powdered root) in the liquid intended to dissolve out its soluble principles. It is the same as maceration at a higher temperature than that of the air.

Distillation is the process by which a liquid is converted into a vapour on the application of heat, and the vapour is condensed into a liquid again in a separate vessel. The variety of apparatus for the process is endless. The simplest would consist of a closed vessel called a retort, from the top of which a long tube leads to a receiver. On partially filling such a vessel with a volatile liquid, and applying heat till boiling, the vapour of the liquid would fill the upper part of the vessel and tube, during its passage through which it would be cooled or condensed, and drop into the cold receiver as a liquid. The object of distillation is to combine volatile substances which cannot otherwise be mixed, as in the preparation of the waters, or to separate mixed volatile and fixed substances, as in making Spt. Ammon. Fœtid., or to separate impurities from the liquid which could not be got rid of otherwise. Distillation is a mixed process, consisting of ebullition—by which, in the first instance, the volatile substance is converted into vapour—and of condensation, by which the vapour is again changed into a liquid.

Destructive or **Dry Distillation** is the process by which a body is decomposed by heat into volatile products which did not previously exist in it, the products being collected in a separate vessel, as in the production of acetic acid and tar from wood.

Fractional Distillation means the distilling of a mixture of substances volatile at different temperatures, whereby they may be separated and received into different vessels by regulating the temperature.

Drying is a process used in the preparation of a great many remedies. There are, however, no official directions given for the drying of roots, leaves, seeds, &c.; these are generally submitted to a uniform temperature in a room, heated by steam or hot water pipes, after being spread out on shallow trays or drawers of network. The best heat is one ranging between 100° and 130° F. Many plants which are used in Pharmacy are dried simply by exposure to the sunshine of their native country, but this is not practicable in our latitude. Flowers should be allowed to dry spontaneously. Fleshy roots should be transversely sliced before being placed in the drying room. Crystals

and precipitates, as a rule, stand higher temperature, and may be dried on a water bath. Others require still higher temperatures, especially when we aim at the expulsion of the water of crystallisation, as in drying alum and sulphate of iron—where a heat of nearly 400° is required. On the other hand, some salts, like the valerianate of zinc, must be dried at the ordinary heat of the surrounding atmosphere. Carbonate of potassium and slaked lime recently heated are used to absorb the water from alcohol, freshly burned lime from ether, whilst sulphuric acid is used in various drying processes.

Elutriation—The process of powdering rough insoluble substances like chalk, ores, &c., and mixing them with water, so that the finer, light, powdery portion may be poured off after the coarser particles have fallen to the bottom. It is done sometimes merely to wash away such impurities as sand, gravel, &c.; in its results it resembles sifting.

Expression is the process by which the juice or oil is squeezed out from vegetable substances, and the tincture or spirit from the mare after maceration or percolation. It is performed by putting the substance into a suitable press, and by mechanical power separating the solid from the liquid portions. Oils so obtained are called expressed or fixed oils, to distinguish them from volatile or distilled oils.

Evaporation is the process by which the volume of a liquid is reduced and its volatile constituents driven of by a heat ranging between that of the air and the boiling point of the liquid. It is employed in the making of extracts, in the crystallisation of salts, and many other operations in Pharmacy. The vessels used should be very shallow, and present a large surface of the liquid exposed to the air. In evaporating vegetable juices and infusions, a moderate heat should be employed—say about 140° F. The nearer the liquid is kept to the boiling point the quicker the evaporation; and small quantities only of vegetable infusions or juices should be subjected to the process, and in separate batches, which can be evaporated down still further if necessary—thus preventing deterioration by long heating. Stirring quickens the process, and the heat may be regulated by the use of a water. steam, or sand-bath.—(For which see "Fusion.")

Filtration is a process by which we separate an insoluble matter or sediment from a liquid, by causing it to flow through the pores of blotting paper, flannel, felt, calico, or linen, the liquid after passing through being clear and bright. *Straining* is a quicker, but rougher, process of the same nature, for the removal generally of *visible* foreign particles, by causing the

liquid containing them to pass through the open meshes of muslin, tow, wool, asbestos, or wire netting. If a liquid is *perfectly* transparent, and offers no obstacle to the passage of light, it is said to be "bright," though it may be highly coloured. All tinctures should possess this quality; and if they do not, repeated filtration, and rest, will brighten them. In the case of very dark liquids, they should also be bright when examined in *minute* quantity by transmitted light. Opposed to this condition we have that of "muddiness," which is often an opprobrium to the pharmacist; it is caused by the presence of *invisible* particles in a state of suspension, producing translucency. A mixture or liquid is said to be "clear" when no *visible* particles of foreign matter are detected in it; hence a liquid may be bright, but not clear, if it contain a few coarse particles floating through it and is otherwise transparent. The treatment for muddiness or opalescence is Filtration; for want of clearness, *Straining* is the remedy.

Fusion, Liquefaction, or Melting, is the process by which solid bodies are rendered liquid by the application of heat; it is largely employed in making ointments, plasters, caustic sticks, and in purifying resins, and for the purpose of decomposition —as in making Potassii Permang. The substances are put into a suitable vessel and heat applied, varying from a temperature of 90°, sufficient to melt lard in an open jar, to one of 800° for fusing zinc in an earthen crucible. The water, steam, and sand-baths are frequently employed. The *water-bath*, as described in the preface to the Pharmacopœia, consists "of an apparatus by means of which water, or its vapour, at a temperature not exceeding 212°, is applied to the outer surface of a vessel containing the substance to be heated." In the *steam-bath*, the vapour of water at a temperature above 212°, but not exceeding 230°, is similarly applied; and in the *sand-bath*, a vessel partially filled with fine sand, is placed upon the top of a stove or on the open fire, and the substance to be heated in a jar or crucible is thrust down into the sand; it differs from the steam or water bath in not limiting the heat to any extent, and is no safeguard against any high temperature being reached; but it effectually prevents sudden changes in the heat, keeping the substance, by a little watching, at a uniform degree. Since alkalies and oxide of lead attack silicious substances, for them iron or silver crucibles must be used. Platinum also is attacked by alkalies, though very feebly.

Gathering of Plants, &c., should be effected when possible, in sunny weather, and at the time specified in any particular case in the Pharmacopœia. Generally, roots of annual plants should be dug up *before* flowering; and perennial roots

should be gathered in winter or very early spring, as soon as the first leaves show themselves above ground, and not till plants are two or three years old at least. Rhubarb should be six years of age. Leaves should be gathered before they begin to change colour, and those of biennial plants not till the second year—as hyoscyamus for example, collected in the first year of its life, is almost inert; some are directed to be gathered when the plant has two-thirds of its flowers expanded, others when the fruit begins to form.

Barks should be collected when they come off most readily from the wood—*i.e.*, from trees in the spring and from shrubs in the autumn. Flowers should be gathered when about four-fifths expanded; the red rose, however, is collected in bud, otherwise it loses its astringency and colour; and the flower-buds of the clove are almost devoid of aroma when fully expanded. Fruits and seeds, generally, are collected when ripe; but the pimento, pepper, bael, and others, are exceptions.

Granulation is the process by which a coarsely crystalline salt is reduced to the condition of a granular powder, by dissolving it in water and evaporating the solution—incessantly stirring till the product becomes dry. Carbonate and citrate of potassium are thus made, and sometimes substances which can scarcely be reduced to powder otherwise are treated in this way, such as sal ammoniac and nitre. Sulphate of iron is granulated by filtering a solution of it into rectified spirit, which is to be kept constantly stirred, so that the crystals which form will be very minute.

Infusion is the process of extracting from a body, commonly of vegetable origin, its virtues or soluble parts, by treating it for a short time with water in a covered vessel, the substance being first reduced to a state of moderate subdivision or coarse powder; generally water in the act of boiling is used. Sometimes, as in the case of cusparia and chiretta, water at a lower temperature is ordered, and cold water is used to extract the virtues of calumba, in order to avoid dissolving the starch contained in it. Quassia yields up its bitter principles to cold water. As a rule, the subdivision of the substance need not be carried to the same extent as for tinctures.

Levigation is the name given to a process like elutriation, in which an insoluble substance is *ground* into powder in presence of water or some liquid in which it is insoluble, the finer parts washed away and collected, the coarser being returned for further grinding with water, and so on till a fine powder is obtained. Red precipitate may be thus reduced. Elutriation is applicable to cheap, coarse materials, like chalk and ores, where the refuse is not ground, but rejected.

Lixiviation.—The process of acting upon a compound or mixed solid, with water, in order to dissolve out a soluble salt, the solution being poured off the insoluble residue and evaporated, as is done in the preparation of pearl-ash from wood-ashes.

Maceration is the process of steeping or soaking at the ordinary temperature of the atmosphere a substance in a liquid capable of dissolving some of its soluble constituents. The liquid is called the *menstruum*, and the rejected matter, which is insoluble, is spoken of as the *mare*. Several tinctures are directed to be prepared in this way. It differs from digestion in being carried on generally for a much longer time, and without heat, and spirit is commonly the menstruum. The drug should be previously reduced to a proper state of comminution by bruising, cutting, or powdering. Frequent agitation is a necessary part of the process, which may be carried on in any wide-mouthed vessel.

Percolation or **Displacement** is one of the most important processes in Pharmacy, being extensively used in the preparation of tinctures. It consists in packing into a short wide tube, closed at one end by tying a piece of calico over it, the substance, in a state of coarse powder, whose virtues are desired to be extracted, and pouring into the tube the menstruum—generally proof spirit. As the spirit filters its way through the column of powder, it dissolves out the soluble parts, and drops finally into the receiver below as a bright tincture. The process may thus be defined to be "the filtration of a liquid through a porous column of a powdered material, so that it may extract its soluble matter." It is not adapted to gummy or adhesive substances, and possesses the great advantages over maceration in being quicker, and in the fact that after the fluid has ceased to drop, the tincture still left in the tube can be displaced by pouring in more spirit or water on the top of the mare. The mixed form of first macerating and then

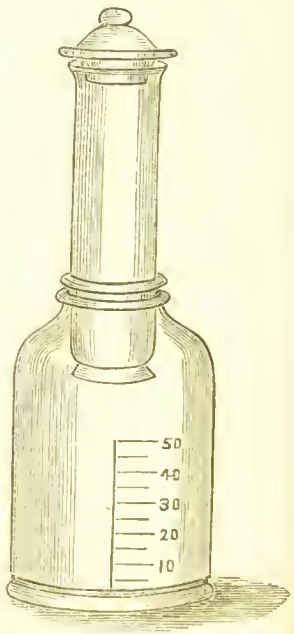


Fig. 21.

percolating, which is generally directed for the manufacture of tinctures, is decidedly better than either process used separately. At the bottom of the tube, immediately over the calico, a layer of fine pebbles or coarse river sand prevents the powder closing its pores. [Fig. 21 represents the most suitable form of apparatus.]

Great skill is required in carrying out the process of percolation, and much depends upon the degree of comminution which the substance receives. If the powder be too fine, it gets into a cake, and prevents the passage of the spirit; and if too coarse, the spirit runs between the particles without dissolving out their active properties, flowing in little channels through the tube into the receiver. The Pharmacopœia now states the degree of fineness requisite for several vegetable tinctures, by ordering the powder to be passed through sieves of definite make. A good deal, also, depends upon the way in which the powder is packed into the tube, and experience only will give an idea of the uniform tightness and pressure required to be used. A heavy, round ebony ruler makes a good ram for packing in the powder.

Pulverisation is the process of reducing solids to powder. The barks, roots, leaves, stems, and fruits of trees and vegetables are first thoroughly dried and afterwards ground in a mill, of which there are many kinds. Leaves lose as much as 80 per cent. of their weight by drying and powdering, the powder often gaining greatly in strength over the fresh leaves. Substances are reduced to the coarse powdered state necessary for infusion and percolation just as they are required, by bruising in an iron mortar, operating only on small quantities at once, and then passing the particles through sieves whose meshes are formed of parallel wires arranged with varying degrees of closeness, the powder which passes through being designated according to the number of parallel wires within a linear inch of the sieve surface. Salts and crystals may be reduced to powder in small quantities in a wedgwood mortar, by grinding or trituration, and sifting through muslin or fine metallic netting, the portion not going through the sieve being returned to the mortar, and the operation being repeated till the requisite fineness is obtained. Camphor can only be powdered by adding about the fourth of its weight of spirit, and triturating it to dryness. Spermaceti, in like manner, by adding a little spirit, may be easily reduced to powder, and tragacanth is best powdered warm. Some substances must be powdered and rubbed with water—"Levigation"—others by granulation, as zinc and tin; and iron, by filing or reducing with hydrogen. The powder differs from the vegetable drug

of the same name, by having less water, essential oil, or volatile constituents, less woody fibre, and in being generally more active—powdered opium being one-eighth part at least more active than the fresh drug. The use of the mortar and pestle is fully described under "Mixing" and "Pill Making." (See page 47.)

Precipitation in Pharmacy, as in the laboratory, is the process by which we get a substance deposited from a solution, either by adding a second liquid in which it is insoluble, as in pouring water into spirit of camphor, or by mixing two solutions of different salts which combine and form an insoluble compound—as in mixing solutions of perchloride of mercury and iodide of potassium together, the iodide of mercury being thrown down as an insoluble crystalline powder, which is washed by the process of affusion.

Sifting is the process of separating the coarser from the finer particles of pulverised substances, and is generally performed by passing them through the meshes of fine wire, horse-hair, or muslin sieves. The Pharmacopœia now specifies the size of the meshes (see under Pulverisation). When fruits, like prunes, tamarinds, or figs, are ordered to be sifted, the operation is called "Pulping;" here considerable force must be employed to press the finer particles through, which, in the case of dry powders, are allowed to drop through by their own weight.

Solution.—The condition of a substance dissolved in a liquid is a state difficult to define. Most of the instances of solution in Pharmacy are *simple*, as the solution of sugar in syrup, in which case the sugar is found unaltered on evaporation; in others, as in the saccharated solution of lime, the substance is in a state of *chemical* solution, and cannot be recovered unaltered on evaporating. Others again are more difficult still to define, as the solution of one liquid in another, or of a gas in a liquid. The process of solution, with very few exceptions, is quickened by heating the solvent, and having the substance to be dissolved in fine division. Both these advantages are gained by the ordinary method of rubbing the substance in a mortar, with hot water. When the hot solvent ceases to dissolve any more of the substance, the solution is said to be saturated, and, on cooling, will always deposit some of the salt in crystals, the liquid, when cold, being called a cold saturated solution.

Sublimation is the process by which a solid is reduced by heat to the state of a vapour, which is condensed and deposited on the surface of another vessel, either in masses, when it is

called a *sublimate*, like arsenic; or in a feathery pulverulent state called *flowers*, as in the preparation of sulphur. Sometimes this process is improperly called dry distillation.

Testing.—The British Pharmacopœia, to ensure the purity and identity of its different preparations, directs, in every convenient case, certain tests; thus the ordinary *qualitative analysis* is employed frequently. Take, for example, the first fluid preparation, "Acetum," which should contain 5·41 per cent. of real acetic acid. The student is directed to try the effects of sulphuretted hydrogen—if lead be present it is discoloured—but it is necessary to prove also that it contains the requisite percentage of acetic acid by *Quantitative* analysis, and the *Volumetric* method, which estimates the quantity by *measuring* the volume of the reagent necessary to produce the change, and afterwards calculating the weight used; and he is informed that one fluid ounce (445·4 grains) of vinegar is neutralised by 402 grain-measures of the volumetric solution of soda, which is found to correspond to 5·41 per cent. of real acetic acid. In testing the strength of diluted phosphoric acid, a different system—the *Gravimetric*—is directed. A given weight of this acid is poured upon a known weight of oxide of lead, and phosphate of lead is formed. This, after being dried, is weighed—the increase in weight giving the amount of phosphoric anhydride present. Complete volatilisation is the test used for several salts, as those of mercury.

Trituration is the process of reducing solid substances to the state of powder by continued rubbing. Generally, in Pharmacy, the operation is conducted in a wedgwood mortar. (See under "Dispensing of Mixtures" and "Pills." Page 47.)

PART II.

THE
ADMINISTRATION OF MEDICINES.

THERE are various routes by which medicines may find their way into the circulating fluid. The most direct would be

(1) *By injection into the veins:* as ammonia, saline solutions, and milk are injected in desperate emergencies, or as blood may be transfused in excessive hæmorrhages.*

(2) Some authorities recommend the *injection* of the remedy *into an artery.*

(3) By *inhalation*, the vapour of the substance finding its way rapidly into the circulation through the extensive sheet of pulmonary blood vessels, as in the administration of anæsthetics.

(4) By *swallowing*—the commonest and most convenient method—the medicines finding their way through the walls of the gastro-intestinal blood vessels, or lacteals, into the current.

(5) By absorption from the *rectum;* in this way the great majority of substances (in the form of enemata or suppositories) may find their way into the blood.

(6) By absorption from the *vaginal* surface in the female, when given in the form of pessary.

* The ordinary aspirator (Dieulafoy's) can be safely used for this purpose if the two rubber tubes are made exactly alike, and each rendered capable of bearing one of the large needles at one end, while the other end is connected with the cylinder of the machine. In this way a thoroughly reliable transfusion apparatus can be always at hand.

(7) By absorption from the *bladder*. Some experimentalists have influenced the system by narcotic remedies injected into the vesical cavity.

(8) By absorption from the *peritoneal* cavity, as has been recently proposed in cases of severe hæmorrhages by injecting milk, &c., into the sac of the peritoneum.

(9) By absorption from the *deep tissues*, as strychnine is often injected into the centre of a large muscle, by the method known as "*parenchymatous injection*."

(10) By the *hypodermic method;* a solution of the substance being injected by a fine syringe* into the *subcutaneous areolar tissue*, from which it is rapidly absorbed by the small blood vessels and lymphatics. In this way morphine is best given to relieve severe pain, and ether to counteract the shock of formidable hæmorrhages.

(11) By the skin. Through the cutaneous tissue medicines may be administered with the view of affecting the system, by four methods :—

1. The Enepidermic.
2. The Epidermic or Iatroleptic.
3. The Endermic.
4. By Inoculation.

In the *Enepidermic* method friction is not employed; the medicine to be so administered is simply placed in contact with the skin. Though this is, at the best, a slow and uncertain way to introduce a remedy into the circulation, the results of experiments show that the alkaloids dissolved in chloroform, when placed in contact with the unbroken skin, are readily absorbed, and soon find their way into the blood. Waller has shown that this endosmotic quality of chloroform enables it to penetrate the skin of the cadaver and to carry the alkaloids with it. Watery or alcoholic solutions either do not enter the blood at all when administered in this way, or are absorbed in such small quantities that they may be regarded as inert.

* It may not be out of place here to remind the student that the ordinary hypodermic syringe (commonly known as Wood's) can be used as an aspirator for all diagnostic purposes, in every respect equal to, and in many decidedly superior to, the most improved instruments. The piston must fit *perfectly*, and the cylinder should be partially filled with water, when the needle may be thrust into the tissues in search of the suspected pus. A few turns of the piston inject a harmless quantity of water, which clears the needle, and allows the puriform liquid to ascend on the motion being reversed; a single drop of pus is evident, as it wells up through the column of clear water. All superficial and most deep abscesses may be detected in this way, and pleural fluid can be easily demonstrated.

By the *Epidermic* method the medicine is also introduced into the system through the unbroken cuticle, but friction is employed. In this way we administer cod-liver oil in wasting diseases, and mercurial ointment in syphilis.

By the *Endermic* method the difficulty of absorption through the cuticle is obviated by its removal. This is accomplished by soaking a piece of porous fabric in strong solution of ammonia, applying it to the surface of the skin, and instantly covering it over with a piece of oiled silk, or a watch-glass, when speedy vesication ensues. The remedy, in the state of fine powder, should be dusted over the denuded spot, when its rapid absorption will occur. In this way morphine, strychnine, or atropine can be administered. The same result follows if the remedy be applied over a portion of skin whose cuticle has been removed by an ordinary cantharides plaster.

By the operation of *Inoculation* (as for small-pox) remedies may be introduced into the system through the punctured cuticle.

These different methods or routes by which medicines find their way into the system should not be confounded by the student with the various *local* methods of applying remedies. Thus, sternutatories are applied to the nasal mucous membrane, and substances, by the method of insufflation, are brought in contact with the posterior nares and surrounding parts; or the nasal douche may be employed with the same intention. Sialagogues are used to act on the salivary glands through stimulation of the nerves distributed to the mucous membrane of the mouth.

The fauces and tonsils are reached by gargles, and the larynx by atomized spray; while the bronchial mucous surface may be exposed to the local action of various inhalations, or to the fumes of volatile substances in a state of combustion.

In the same way, most of the cavities of the body, all tortuous wounds, and open sores, may be reached by injections, lotions, bougies, pessaries, suppositories, &c.

DOSAGE OR POSOLOGY.

Before the student considers the question of prescription writing, it will be necessary to say a few words about the doses of medicines. As the alphabetical arrangement of this work will enable him to find at a glance the dose of every drug in the Materia Medica; and in a similar way the dose of all the various Galenical preparations are tabulated; it will

thus be unnecessary here to have any repetition in the form of tables or lists of doses.

Though the official doses may be regarded as safe guides, still the student must remember that there are many conditions which modify very considerably the effect of remedies, and should materially affect their dosage.

The most important of these modifying agents are:—

AGE,

IDIOSYNCRASY,

HABIT,

INTERVAL BETWEEN THE DOSES,

DISEASE,

CLIMATE,

RACE AND TEMPERAMENT,

FORM IN WHICH THE MEDICINE IS ADMINISTERED,

ACCUMULATION,

TEMPERATURE,

HOUR OF THE DAY,

FASTING, &c.

Age.—This is the most important factor in determining the amount of the dose, and is the one which gives most trouble to the student. Though no reliable rule can be laid down for his guidance in all cases, the following plans of Gaubius and Young may be serviceable when memory fails in recalling the exact amount of dose recommended by posologists. In the Materia Medica portion of this book, the dose for a child one year old is given under the heads of the most frequently employed infantile remedies. It should be remembered that children bear opiates very badly, and their use, consequently, is unsafe for children under one year old, even in most minute doses.

This intolerance of opium, it may be, has led to very erroneous ideas about the amount of the dose of other remedies for children.

Children will often bear nearly as full doses as adults, of various remedies, as may be seen in the case of arsenic, calomel, squill, belladonna, ipecacuanha, and many purgatives, like rhubarb, jalap, &c.

Gaubius took the average adult dose of a remedy as 1, say 1 grain, and calculated the requisite amount for the different ages thus:—

For a child 1 year old, ... $\frac{1}{13}$ to $\frac{1}{12}$ grain.
For a child 2 years old, ... $\frac{1}{8}$ grain.
For a child 3 years old, ... $\frac{1}{6}$ grain.
For a child 4 years old, ... $\frac{1}{4}$ grain.
For a child 7 years old, ... $\frac{1}{3}$ grain.
For a child 14 years old, ... $\frac{1}{2}$ grain.
For a patient 20 years old,... ... $\frac{2}{3}$ grain.
For a patient from 21 to 60 years old. 1 grain.

Young's rule is—"That for children under 12 years the doses of most medicines must be diminished in the proportion of the age to the age increased by 12."

If the student wishes to find out the dose for a given age by this method, he has simply to add 12 to the age in years, and divide the age by the amount thus obtained, the answer giving a fraction, which is the required amount of the full adult dose. Thus, suppose the adult dose to be 1 grain, the dose will be:—

For a child 1 year old, ... $\frac{1}{1+12}$ = $\frac{1}{13}$ grain.
For a child 2 years old, ... $\frac{2}{2+12}$ = $\frac{1}{7}$ grain.
For a child 3 years old, ... $\frac{3}{3+12}$ = $\frac{1}{5}$ grain.
For a child 8 years old, ... $\frac{8}{8+12}$ = $\frac{2}{5}$ grain.
For a child 12 years old,... $\frac{12}{12+12}$ = $\frac{1}{2}$ grain.

Idiosyncrasy.—The physician meets with individuals in whom an ordinary dose of some well-known drug causes symptoms more intense, or entirely different from those usually observed to follow its administration, and when these cannot be accounted for by any known law, the case is generally spoken of as one of idiosyncrasy.

Patients are occasionally met with in whom the smallest dose of calomel will be followed by profuse salivation, whilst enormous doses of opium and chloroform are sometimes borne by those unaccustomed to their use.

Habit determines the dose of some medicines more than any other influence; this is particularly true of narcotics. Many instances are recorded of opium eaters who took a pint of laudanum daily without experiencing the soporific effects of

the drug, and the arsenic eaters of Styria are examples of the same.

The *interval between the doses* should determine to a large extent the amount of the dose; this is too frequently overlooked in tables. No rule can, however, be laid down on the subject, but the student should be guided by the nature of the action of the medicine, the effects required to be produced by it, and the rate of its absorption, &c.

Disease modifies considerably the dose of a medicine; instances of this may be seen in the large quantities of opium needed in desperate inflammations and intensely painful conditions of various nerves. Mercury and opium are badly borne in albuminuria, whilst to syphilitic children large quantities of grey powder can be freely given.

Climate, *Temperament*, *Sex*, *Stature*, *&c.*, possess varying effects upon the amount of medicine required to produce its results in a healthy individual, and some *conditions of the medicine* itself (chiefly those which relate to its rate of absorption or elimination) affect materially the amount of the dose.

The *Temperature* of the patient and of the surrounding atmosphere has a very decided effect upon the dose of many medicines. Brunton has found that substances like veratrine, strychnine, &c., act in entirely different ways according as the temperature is high or low. This may to some extent be the explanation of the indication for the administration of stimulants in the *early morning* in severe fevers and collapse.

Fasting. The rapidity with which medicines are absorbed and affect the system in this condition are well recognised.

The *method by which the medicine is administered* affects the dose; thus, as a rule, the dose of remedies given by the rectum requires to be twice as great as if given by the mouth. Strychnine is an exception, being more active if given by the bowel than if swallowed. The dose may be said to be about a half, or two-thirds, of the ordinary quantity when administered by the hypodermic method.

Accumulation modifies to some extent the dose of a medicine. After digitalis, strychnine, or bromide of potassium have been administered for a time some observers have noticed the sudden onset of the marked physiological symptoms produced by these remedies. In such a case the dose must be diminished or suspended; and after its renewal the interval between the doses should be lengthened. The explanation in these cases is clearly that the elimination of the drug has been interfered with, and Christison pointed out that the active principle of digitalis so contracts the renal vessels that its exit from the system is delayed; the same is true of strychnine as pointed out by Gärtner.

INCOMPATIBILITY.

It is of the utmost importanee that the physieian should avoid ordering remedies whieh, when mixed, destroy eaeh other's virtues. Ineompatibility is generally said to be threefold :—

CHEMICAL.
THERAPEUTICAL.
PHARMACEUTICAL or ABSOLUTE.

Of the first may be instaneed syrup of squill and salvolatile ; aeetate of lead and sulphurie aeid, or sulphate of zine ; iron, and the numerous substanees eontaining tannie aeid.

As an example of the seeond form of ineompatibility may be mentioned a mixture, or pill, eontaining stryehnine and Calabar bean.

Substanees are said to be *absolutely* ineompatible when they eannot be mixed together by the pharmaeist, as borax and mueilage, or one part of tineture of tolu, myrrh, or benzoin, when ordered with 7 of water.

Experienee proves that many eompounds, regarded formerly as ineompatible, are valuable eombinations. It does not follow if a mixture be *inelegant* that it is worthless, though some eonsider sueh should be regarded as an ineompatible and never employed. The offieial Mist. Ferri Co. and Mist. Ferri Aromat. may be eited as useful preparations, though instanees of ineompatibles.

Unfortunately, no rule ean be laid down to prevent the student ordering substanees whieh oppose eaeh other in their aetion in the system, or whieh ehemieally deeompose eaeh other, or whieh will refuse to take the intended shape from the hand of the dispenser. Nevertheless, a fair preliminary knowledge of ehemistry and pharmaeology will generally prevent sueh a mistake.

Amongst the various general rules of ineompatibility there is one whieh the student should remember—*that a drug should never be ordered in eombination with any of its Tests or Antidotes.*

The most important eases of ineompatibility being mentioned under the head of the respeetive substanees in the Materia Mediea portion of this work, and in the portion dealing with Extemporaneous Pharmaey, no enumeration need be here made of them.

The substanees in the following short list ean be eombined with so few preparations that the student will be wise to order them alone in simple solution :—

PERMANGANATE OF POTASSIUM,
TANNIC and GALLIC ACIDS.
CORROSIVE SUBLIMATE.
IODIDE OF POTASSIUM.
SALTS OF LEAD.
SALTS OF ZINC.
IODINE and its LIQUID PREPARATIONS.
NITRATE OF SILVER.
SULPHURIC ACID.
TINCTURE OF GUAIACUM.
CITRATE OF IRON AND QUININE.
FREE CHLORINE IN SOLUTION.

The various prescriptions scattered throughout the portion of this work devoted to Therapeutics will materially assist the student in selecting elegant and useful forms in which to administer the most important remedies. Some, indeed, of these may be open to the objection of containing incompatible substances, as iodide of potassium and corrosive sublimate; but where a combination has been proved by experience to be valuable, its inelegance or supposed incompatibility has been occasionally overlooked.

THE COMBINATION OF MEDICINES.

The compounds of the last generation, containing numerous absurd and incompatible ingredients have, it is to be feared, forced many into the opposite extreme of simplicity. In this way combinations of remedies of the utmost value have fallen into disuse.

Paris pointed out the great advantages to be derived from a judicious combination of medicines: thus he found that the action of a medicine may be increased by combining several different preparations of it. Suppose, for example, we wish to get *all* the virtues of cinchona, we obtain them best from a mixture like the following:—

℞. Ext. Cinchonae Liq. ℥ij.
Tinct. Cinchonae. ℥j.
Decoct. Cinchonae. ℥iv.
Infus. Cinchonae. ad. ℥x.
Misce.

Fordyce showed that a much more valuable and reliable remedy may be obtained by combining various substances whose actions resemble, or are identical with, each other. Thus, the best diuretic would be a mixture of digitalis, squill, broom, and bicarbonate of potassium, infinitely superior to a proportionate dose of any one of them when administered singly.

The action of some medicines is increased by combining with them substances, the previously known qualities of which would have given no clue to their usefulness in this respect; thus, the diuretic power of digitalis and squill is intensified by mercury.

By the judicious combination of two or more remedies we are often enabled to correct undesirable qualities possessed by one of them; thus alkalies correct the griping of aloes, and hyoscyamus that of colocynth; arsenic prevents the acne which follows the administration of bromide of potassium; and atropine corrects the unpleasant symptoms caused by a hypodermic dose of morphine.

By a proper regulation of the dose of various remedies of the same class, though differing in their methods of action, occasionally, a better compound may be obtained, as pointed out by Paris; thus, by giving a cholagogue with a saline, more effectual purgation is obtained; or by combining bromide of potassium with a narcotic, a hypnotic can be procured, which is more satisfactory in its operation than most sleep producers.

WEIGHTS, MEASURES, AND SYMBOLS USED IN PRESCRIBING.*

The weights used in prescribing and dispensing are of the official system, which starts with the Troy grain and ends with the avoirdupois pound.

1 Grain, *gr.*	=	1 grain.
1 Ounce, *oz.*	=	437·5 grs.
1 Pound, *lb.*	=	7,000 grs.

* At the end of this book, before the Index, will be found a full table of the Official Weights and Measures.

The official Measures of Capacity which are generally met with in prescriptions are :—

1 Minim,	*min.*	= 1 minim	=	·91 grs. of water.
1 Fluid Dram,	*fl. drm.*	= 60 minims	= 54·68	,, ,,
1 Fluid Ounce,	*fl. oz.*	= 8 fluid drams	= 437·5	,, ,,

It will thus be noticed that there is no *official weight* between 1 grain and 1 ounce; but the ℥i. and ℈i., which represented the $\frac{1}{8}$ and $\frac{1}{24}$ part of the old Troy ounce, are still permitted to exist under protest. They are, when used in a prescription, to be taken as meaning 60 grs. and 20 grs. respectively, and not the $\frac{1}{8}$ and $\frac{1}{24}$ of the Avoirdupois ounce, which would be 54·68 and 18·22 grains respectively.

The French Gramme, = 15·432 grs.

The following are the symbols and signs met with in prescription writing; they must not be confounded with the *official* symbols, which are simply the first two letters of the English words, as fl. oz., fl. drm., &c.

Gr. = Granum, 1 grain = $\frac{1}{480}$ of a Troy ounce, or $\frac{1}{437}$ of an Avoirdupois ounce.

℈. = Scrupulum, 1 scruple = 20 grains.

℥. = Drachma, 1 dram = 60 grs. or 3 scruples or $\frac{1}{8}$ of a *fluid* ounce, or 60 minims.

℥. = Uncia, 1 ounce = 1 Troy oz. (480 grs.) or 1 fluid oz. (480 minims), or 437·5 grains of water.

M. = Minimum, 1 minim = $\frac{1}{60}$ part of a fluid dram or the volume of ·9115 grains of water.

Gtt. = Gutta, 1 drop, erroneously supposed to represent 1 minim.

O. Octarius, 1 pint, = 20 fluid ounces, or $1\frac{1}{4}$ lbs. of water.

C. Congius, 1 gallon = 8 pints, or 10 lbs. of water.

DOMESTIC MEASURES.

A teaspoonful—Cochleare minimum	=	1 fluid dram (℥j.)
A dessertspoonful—Cochleare medium	=	2 fluid drs. (℥ij.)
A tablespoonful { Cochleare amplum, or Cochleare magnum }	=	4 fluid drs. or $\frac{1}{2}$ oz. (℥iv.) or ℈ss.
A wine-glassful—Cyathus vinarius	=	$2\frac{1}{2}$ fluid oz. (℥iiss.)

The practice of measuring medicines in spoons is open to very serious objections, since seldom will two be found just alike in capacity; and the physician should make a rule of examining the spoon and ascertaining its dimensions before the patient uses it as a measure. The common "kitchen" spoon, which is generally made of iron and coated over with tin, fluctuates less in size than the other domestic measures; it can be relied upon as holding two fluid drams. The wine-glass is generally stated to contain 1½ to 2 oz. It will, however, be nearly always found to contain at least 2½ oz., or the eighth part of an Imperial pint.

A small tea-cup contains on an average about 7 fluid ounces, and a breakfast-cup about 12 fluid ounces. These figures are much above those mentioned in most books.

An ordinary tumbler holds generally half-a-pint. In all cases where the physician prescribes an *active* medicine he should order the dose to be measured in a graduated glass.

The mistake of counting drops as minims has been already referred to in the Pharmacy Section (p. 26).

PRESCRIPTION WRITING.

In one sense, this may be said to be the highest accomplishment of the educated physician, since it requires for its correct performance an intimate knowledge of all the medical sciences, and a practical acquaintance with the art of Pharmacy. It is to be regretted that a more intimate knowledge of this latter art is not cultivated by the student of medicine. There could scarcely be a more erroneous idea than that which one occasionally meets with—*i.e.*, that Pharmacy is beneath the notice of the physician.

The writer believes there are very few things which give so great advantages in after life to the physician as an intimate acquaintance with this art.

The Model Prescription should consist of the following parts:—

1. The Superscription.
2. The Inscription.
3. The Subscription.
4. The Signature.

The *Superscription*, which consists of the letter ℞, originally was used, it is supposed, to represent the symbol for the planet Jupiter, at a time when much of the virtue of a combination appeared to rest upon the deity or presiding star. By common consent, it is now regarded as representing the imperative mood of the Latin verb Recipio, to take; and the French accordingly commence their prescriptions with P., or Prenez.

2. The *Inscription* may be called the *body* of the prescription; it includes the names of the substances to be administered, with their quantities, written in Latin, and, as it is the most important part of the prescription, it will be referred to presently at more length.

3. The *Subscription* is made up of the directions (in Latin) for the guidance of the dispenser; thus *misce*, often written *m.*, is frequently the only part in a prescription which belongs to the subscription.

4. The *Signature* includes the directions or instructions intended for the benefit of the patient. They are frequently written by the prescriber in English, and many recommend that Latin should never be used for this part of the prescription.

Mistakes are certainly more liable to occur if the signature be written carelessly, or if incorrect Latin be employed, but the same reasons which have determined the use of this language for prescriptions from an early time, apply equally well to the signature. Thus, a prescription written in Latin can be read and understood in every civilised country. Abbreviations and contractions can be employed without fear of being misunderstood, which could not be the case if any other language were substituted; we are thus often able, by a single letter, to express the meaning of several English words.

It is often absolutely *necessary* to write the inscription in such a way that the patient may remain innocent of the nature of its contents.

The use of long and elaborate Latin phraseology is to be condemned in prescribing, and the student, when he feels any difficulty in expressing himself in this tongue, had certainly better fall back upon his English when writing the signature.

The patient's name is written at the top or bottom of the recipe, preferably the top, as it is thus less liable to be overlooked or mistaken than if written where space is often limited. The prescriber's initials generally follow at the right hand corner, and the date is written opposite.

☞ The student should not confound the *initials* of the prescriber with that portion of the prescription called the signature—*i.e.*, the directions to the patient.

It is hardly necessary to remind the student of the necessity of writing clearly and legibly, and of avoiding the use of such contractions as might lead to mistakes.

The *body* or inscription of a model prescription should contain the following :—

The *Basis* or principal active ingredient.

The *Adjuvant*, or *Auxiliary*, to assist its action.

The *Corrective*, to correct or diminish some undesirable quality.

The *Vehicle*, or *Excipient*, to give a suitable form for administration.

The following prescription may be regarded as a very commonly ordered combination of remedies :—

℞ SUPERSCRIPTION.

(Basis.) Pot. Acet. ʒv.
(Adjuvant.) Tinct. Digitalis ʒj. } INSCRIPTION.
(Corrective.) Syr. Aurantii ʒj. } INSCRIPTION.
(Vehicle.) Dec. Scopar. ad ʒviij. } INSCRIPTION.

Misce, fiat mist. SUBSCRIPTION.

Cpt. Cochl. mag. ii. ℔ ta. q. q. hora ex paul. aquae } SIGNATURE.

Without abbreviations or contractions, it would read thus—

Recipe.

Potassii Acetatis drachmas quinque.

Tincturæ Digitalis drachmam unam.

Syrupi Aurantii unciam unam.

Decoctum Scoparii ad uncias octo.

Misce, fiat mistura. Capiat cochlearia duo magna quarta quâque hora ex paululo aquæ.

The student will find benefit from a careful study of the following pages, in which the Latin of the above prescription is arranged according to the English idiom, and each word parsed and translated:

Latin Idiom:

Recipe Potassii Acetatis drachmas quinque.

R. (Recipe) ... { v. irr. tr. im. m. 2nd per. s., to agree with its nom. *Tu*—"thou" (understood). Rule i., recipi-o, recep-i, recep-tum, recipere. } Take thou

v (quinque) ... { num. adj. indec. ac. pl. qual. and agreeing with drachmas. Rule ii. } five

ʒ (drachmas) ... { n. f. ac. pl. Rule viii. (*a*) drachma—æ. } drams

Acet. (acetatis) ... { n. f. gen. s. qual. drachmas. Rule vi.(*a*), acetas—atis. } of acetate

Pot. (potassii) ... { n. n. gen. s. qual. acetatis. Rule vi.(*a*), potassium-ii. } of potassium.

Latin Idiom:

Recipe Digitalis Tincturæ drachmam unam.

R. (Recipe) ... (understood) Take thou

j (unam) ... { num. adj. ac. s. qual. and agreeing with drachmam. Rule ii., unus—a—um. } one

ʒ (drachmam) ... { n. f. ac. s. gov. by recipe. Rule viii.(*a*), drachma—æ. } dram

Tinct. (tincturæ) { n. f. gen. s. qual. drachmam. Rule vi.(*a*), tinctura—æ. } of the tincture

Digit. (digitalis)... { n. f. gen. s. qual. tincturæ. Rule vi.(*a*), digitalis—is. } of digitalis.

Latin Idiom:

Recipe Aurantii Syrupi unciam unam.

R. (Recipe) ... (understood) Take thou

j. (unam) ... (parsed as before) one

℥ (unciam) ... { n. f. ae. s. gov. by recipe. Rule viii.(*a*), uncia—æ. } ounce

Syr. (syrupi) ... { n. m. gen. s. qual. unciam. Rule vi(*a*), syrupus—i. } of syrup

Aur. (aurantii) ... { n. neu. gen. s. qual. syrupi. Rule vi.(*a*), aurantium—ii. } of orange peel

Latin Idiom:

Recipe Decoctum Scoparii ad uncias octo.

R. (Recipe) ... (understood) Take thou

*Decoct.**(decoctum) { u. neu. s. acc. gov. by recipe. Rule viii.(*a*), decoctum—i. } decoction

Scop. (scoparii) ... { n. masc. gcu. s. qual. decoctum. Rule vi. (*a*), scoparius—ii. } of broom

Ad. prep. gov. uncias. Rule viii. (*b*) up to

viij. (octo.) ... { num. adj. indec. qual. uncias. Rule ii. } eight

℥ (uncias) ... { n. f. ac. pl. gov. by ad. Rule viii (*b*), uncia—æ. } ounces.

☞ N.B.—The student must have a clear idea of the meaning of this Ad. It means that the dispenser after measuring the other ingredients must add enough of the decoction to make the entire quantity measure 8 oz.

Latin Idiom:

Misce, fiat mistura.

M. (misce) ... { v. trans. imp. m. p. t. agreeing with and gov. by (tu) understood. Rule i. misceo—ui, mixtum or mistum miscere. } Mix you, or mix,

Mis. (mistura) ... { n. f. nom. s. governing fiat. Rule i., mistura—æ. } let a mixture

Ft. (fiat) ... { v. used as passive of facio, pres. sub. 3rd s. used as imp. gov. by and agreeing with mistura; fio, factus sum, fieri; to be made or become. } be made.

Latin Idiom:

Capiat cochlearia magna duo quarta quâque horâ ex aquæ paululo.

Cpt. (capiat) ... { irr. v. tr. sub. m. pr. t. 3rd per. s. agreeing with and gov. by (is) understood Rule i., capio, cepi, captum, capere, the present, subjunctive used as an imperative. Rule x.(*a*). } He may take, or let him take,

ij. (duo) { num. adj. ac. pl. neut. qual. and agreeing with cochlearia. Rule ii. duo—æ—o. } two

☞ * Some authorities would put Decoct. in the genitive—a partitive genitive—*i.e.*, "of decoction." In the same way, where the student meets *Aquam ad* ℥—, in the different prescriptions throughout the Fourth Part of this work, he may substitute *Aquæ ad* ℥. Either form is correct.

Mag. (magna) ...	adj. ae. pl. neut. qual. and agreeing with eochlearia. Rule ii., magnus—a—um.	large
Coch. (cochlearia)	n. ac. pl. neut. gov. by capiat. Rule viii.(*a*) eochleare—is.	spoonfuls
q.q. (quâque) ...	pron. indef. abl. s. qualifying and agreeing with hora. Rule ii., quisque, quæque, quodque.	at each
4ta (quarta) ...	num. adj. abl. s. qualifying and agreeing with hora. Rule ii.. quartus—a—um.	fourth
Hora	n. f. abl. s. Rule ix.(*a*), hora —æ.	hour
Ex.	prep. Rule ix.(*c*).	out of (in)
Paul. (Paululo) ...	adj. abl. s. used as an noun, gov. by ex, paululus—a —um.	a little
Aq. (Aquæ) ...	n. f. gen. s. qual. paululo. Rule vi., aqua—æ.	of water.

GRAMMATICAL AIDS TO PRESCRIPTION WRITING.

Two languages differ in *words*, *inflections*, and *idioms*.

"A student who wishes to read the Latin language must thus understand the *meaning* of its words; the *force* of its inflections; and the *nature* of its idioms."

As far as *words* are concerned, a limited knowledge of this language, and one sufficient for the intelligent reading and writing of physicians' prescriptions, may be obtained from the following brief vocabulary.

The *inflections* may be learned from any Latin Grammar: whilst the student may obtain a fair conception of the *idioms* or order of words from a careful study of the few important rules of Syntax which follow.

A FEW RULES OF LATIN SYNTAX APPLICABLE TO THE CONSTRUCTION OF PHYSICIANS' PRESCRIPTIONS.

Syntax is generally divided into two parts—CONCORD and GOVERNMENT.

Concord is the agreement between two Latin words, one influencing the other. There are three concords:—

1. A Verb, with its subject (as Rule I).
2. Adjectives, with the nouns which they qualify. (Rule II.)
3. The Relative, with its antecedent. (Rule III.)

Rule I.

A personal verb agrees with its subject or nominative in number and person; as, *Ego tero*—I rub: *Tu sumas*—You may take; *Id fiat*—It may be done.

In prescription writing, the *active* voice of verbs is generally only used in the 2nd person singular of the imperative mood, and 3rd person singular or plural of the present subjunctive.

The use of the *passive* voice is generally confined to the 3rd person singular or plural of the present subjunctive, and the different parts of the gerundive.

Rule II.

Adjectives, participles, and pronouns, whether belonging to the subject or the predicate, agree in gender, number, and case with the noun or the pronoun to which they refer; as *Pulvis unus*—One powder; *Uncia una*—One ounce; *Sevum præparatum*—Prepared suet.

Rule III.

The relative must agree with its antecedent in gender, number, and person; as, *Syrupus qui optimus est*—The syrup which is best; *Mistura quæ bona est*—The mixture which is good; *Medicamentum quod neglectum est*—The medicine which has been neglected.

Rule IV.

If a verb has more than one subject the verb must be put in the plural number; as *Pilula et mistura capiantur*—The pill and mixture are to be taken.

Rule V.

A participle governs the same case as the verb to which it belongs; as *Augendo quantitatem*—By increasing the quantity.

Rule VI.

The Genitive case primarily signifies the class to which a thing belongs; therefore—

(*a*) It depends on another noun as a notion which it qualifies or determines; as, *pulveris granum*—a grain of powder.

(*b*) Or it is used to signify the whole from which a part is taken; as, *nimium doloris*—too much (of) pain.

(*c*) Adverbs of quantity, time, place, &c., govern the partitive genitive; as, *satis aquæ*—enough (of) water.

(*d*) Adjectives of plenty or want govern a genitive or ablative; as, *dives quiniæ*—rich in quinia; *dives aqua*—rich in water.

Rule VII.

Dative.—The sign of the dative case is *to* or *for*.

(*a*) Adjectives which imply likeness or unlikeness, advantage or disadvantage, &c., govern the dative; as, *ceræ similis*—like to wax.

(*b*) Verbs of giving or imparting, &c., govern the dative of the indirect object as well as the accusative of the direct object: *contusum liquori redde*—return the bruised (substance) to the liquor.

Rule VIII.

Accusative.—The accusative was originally used to mark the immediate object of an action.

(*a*) Transitive verbs in the active voice generally govern the accusative case; as, *citratem calcis lava*—wash the citrate of lime.

(*b*) The following prepositions govern the Accusative:—

Ad	To, at, for.
Adversum, adversus	Against, towards.
Ante	Before.
Apud	At, with.
Circum	Around.
Contra	Against.
Extra	Outside.
Infra	Below.
Inter	Between, among.
Ob	On account of.
Per	Through, by.
Pone	Behind.
Post	After.
Prope	Near.
Secundum	Following, or according to.
Supra	Above.

(c) The following prepositions govern the Ablative as well as the Accusative :—

In	(ae.) Into ; (ab.) in.
Sub	(ae.) Under ; (ab.) near.
Subter	(ae. and ab.) Under.

Rule IX.

The Ablative received its name because it signifies ablation, or separation, the sign of which is *from*.

(a) Cause, manner, means, instrument, time when, and place where, are put in the ablative ; as, *balneo arenæ*—in a bath of sand.

(b) *Opus* and *usus* are followed by an ablative ; as, *cibo opus est nobis*—we have need of food.

(c) The definite answer to the questions "when" or "how" is expressed by a noun or pronoun and a participle in the ablative case, and is called the ablative absolute ; as, *liquoribus omnibus mixtis*—all the liquors having been mixed.

The following prepositions govern the Ablative :—

A, ab, abs	Away, from, by.
Cum	With.
De	Down, from, of, about.
E, ex	Out of, from, after.
Præ	Before, because of.
Pro	For, before, according to.
Sine	Without.

(d) *Utor*, *abutor*, and a few other verbs govern the ablative ; as, *utatur sequenti*—let him use the following.

Rule X.

The imperative mood is used to express requests or commands ; as, *Recipe*—Take (thou).

(a) The present subjunctive mood is often used instead of the imperative ; as, *fiat mistura*—let the mixture be made.

LATIN WORDS AND PHRASES MOST FREQUENTLY USED IN PRESCRIPTIONS, FULLY EXPLAINED.*

Aa, Ana (Greek preposition) of each.

A, ab, prep. by or from (governs abl.)

Ad 3tiam vicem = ad tertiam vicem. For three times.

Ad lib. = ad libitum. (*ac., s., libitus-i. Rule* viii.) At pleasure.

Add = Adde, *im, m.* (*addo, -didi, -ditum, -ere.*) Add.

Admov. = Admove, *im, m.* (*Admoveo, -vi, -tum, -ere.* Apply.

Æger, ægra, ægrum, *adj.* Sick. (The Patient.)

Albus (*-us, -a, -um, adj.*) White.

A. H., Alternis Horis. (*ab. pl. Rule* ix.) Every other hour.

Alvus (*-i, n., fem.*) The Bowels.

Alvo Adst. = Alvo adstrictâ. The bowels being confined.

Amplus (*-us, -a, -um, adj.*) Large.

App. = Applicandum. (*-us, -a, -um, gerundive.*) To be applied.

Aq. = Aqua. (*-æ, n. f.*) Water.

Aq. Bull.	= Aqua	Bulliens.	(*-entis, adj.*)	Boiling water.
,, Com.	= ,,	Communis.	(*-is, -e, adj.*)	Common ,,
,, Dest.	= ,,	Destillata.	(*-us,-a,-um, adj.*)	Distilled ,,
,, Ferv.	= ,,	Fervens.	(*-entis, adj.*)	Hot ,,
,, Font.	= ,,	Fontalis.	(*-is, -e, adj.*)	Spring ,,
,, Mar.	= ,,	Marina.	(*-us, -a, -um, adj.*)	Sea ,,
,, Niv.	= ,,	Nivalis.	(*-is, -e, adj.*)	Snow ,,
,, Pluv.	= ,,	Pluvialis	(*-is, -e, adj.*)	Rain ,,

Auris (*-is, n. f.*) The ear.

Aut (*conj.*) Or.

Balneum (*-ei, n. neu.*) A bath.

Bene (*adv.*) Well.

Bibo. (*bibere v. 3rd conj.*) To drink.

Bis Ind. = Bis Indies. (*adv.*) Twice a day.

* ABBREVIATIONS USED.—*ab.* or *abl.*, ablative; *ac.*, accusative; *ad.* or *adj.*, adjective; *adv.*, adverb; *conj.*, conjunction; *f.*, feminine; *gen.*, genitive; *im.* or *imp.*, imperative; *indec.*, indeclinable; *indef.*, indefinite; *irr.*, irregular; *m.* or *masc.*, masculine; *m.* or *mo.*, mood; *n.* or *no.*, noun; *nom.* or *no.*, nominative; *num.*, numeral; *neu.*, neuter; *pas.*, passive; *part.*, participle; *p., pr.*, or *pres.*, present; *pl.*, plural; *prep.*, preposition; *pron.*, pronoun; *s.*, singular; *sub.*, subjunctive; *t.*, tense; *tr.*, transitive; *v.* verb.

B. P. or B. Ph. = British Pharmacopœia.
Brachium (*-ii, n. neu.*) The arm.
C. = Cum. (*prep. gov. abl.* See Rule ix.) With.
Calidus (*-us, -a, -um, adj.*) Warm.
Calor (*-oris, n. masc.*) Heat.
Capio. (See Cpt.) To take.
Caput (*-itis, n. neu.*) The head.
Cataplasma (*-atis, n. neu.*) A poultice.
Ceratum (*-i, n. neu.*) An ointment or cerate.
Charta (*-æ, n. f.*) A powder or a paper.
Cibus (*-i, n. masc.*) Food.
Circa (*prep. gov. accus.*) Around.
Coch. = Cochlear, Coehleare, or Coehlearium. (*n. neu.*) A spoonful.
Coch. Amp. = Coehlear (*-aris*) Amplum. (*-us, -a, -um, adj.*) A tablespoonful.
,, Mag. = Coehlear (*-aris*) Magnum. (*-us, -a, -um, adj.*) A large spoonful; or a tablespoonful.
,, Med. = Coehlear (*-aris*) Medium or Modieum. (*-us, -a, -um, adj.*) A dessert-spoonful.
,, Min. = Coehlear (*-aris*) Minimum. (*-us, -a, -um, adj.*) A small teaspoonful.
,, Parv. = Coehlear (*-aris*) Parvum. (*-us, -a, -um, adj.*) A Teaspoonful.
Cochleat. = Coehleatim. (*Adv.*) By spoonfuls.
Cœna (*-æ, n. f.*) Supper.
Coll. = Collyrium. (*-ii, n. neu.*) An eye-wash.
Colo (*-avi, -atum, -are, v. a.*) To strain.
Co. = Compositus. (*-us, -a, -um, adj.*) Compound.
Comp. = Compositus. (*-us, -a, -um, part.*) Compounded.
Confectio (*-onis, n. f.*) A confection or electuary.
Cong. = Congius. (*-ii, n. masc.*) A gallon.
Conserva (*-æ, n. f.*) A conserve or electuary.
Coq. = Coque. (*coquo, -xi, -ctum, -ere, v., im. m.*) Boil.
Cpt. = Capiat. (*pr. sub. 3rd per. s., capio, cepi, captum capere. Rule* x.) Let the patient take.
Cras (*adv.*) To-morrow.
Crus (*Cruris, n. neu.*) The leg.
Cuj. = Cujus. (*gen. s. of qui, quæ, quod.*) Of which.
Cum (*prep. gov. abl.*) With.

Cyath. = Cyathus. (*-i, n. masc.*) A glass.

C. Vinar. = Cyathus Vinarius. A wine-glass.

D. = Dosis. (*Dosis, n. f.*) A dose.

Da, Det. = Da (*do, dedi, datum, dare, imp. m.*) Give; Detur. *pres. sub., 3rd p. s.* Let it be given.

Decoctum (*-i, n. neu.*) A decoction.

Decub. = Decubitus. (*-us, -a, -um, part.*) Lying down.

De d., in d. = De die (*-es, -ei, n. masc., ab. s. Rule* ix.) in diem. (*Rule* viii.) From day to day.

Dej., Alv. = Dejectiones (*-onum, n. pl.*) Alvi. (*-i, n. f. gen. s.*) Stools, or motion of the bowel.

Dens (*dentis, n. m.*) A tooth.

Dexter (*-tra, -trum, adj.*) Right.

Dieb. Alt. = Diebus (*-es, -ei, n. ab. pl. Rule* ix.) Alternis. (*-us, -a, -um, adj. pl. ab. m. Rule* ii.) Every other day

Digitus (*-i, n. m.*) A finger.

Dim. = Dimidius. (*-us, -a, -um, adj.*) One half.

Div. = Divide. (*-do, -visi, -visum, -dere, im. m.*) Divide.

Div. in p. Æq. = Dividatur (*-vido, -visi, -sum, -ere, v. 3rd per. s. prs. pass. sub.*) in (*prep. gov. partes. Rule* viii. *c.*) partes (*n. ae. pl., gov. by in.*) Æquales (*adj., agreeing with partes.*) Let it be divided into parts equal.

Dolor (*-oris, n. masc.*) Pain.

Donec (*conj.*) Until.

Durant. Dolor. = Durante (*-ans, -antis, part.*) Dolore (*-oris, n. masc.*) While the pain lasts.

Dos. = Dosis. (*is, accusative dosin, n. f.*) A dose.

Drachma (*-æ, n. f.*) A dram.

Dulcis (*-is, -is, -e, adj.*) Sweet

Dum (*adv.*) Whilst.

Duo (*duo, -æ, -o, adj.*) Two.

E or Ex (*prep. gov. abl.*) Out of.

Ejusd. = Ejusdem. (*idem, eadem, idem, gen. s.*) Of the same.

Effervescentia (*-æ, n. f.*) Effervescence.

Elect = Electuarium. (*-ii, n. neu.*) An electuary.

Emesis (*-is, n. f.*) Vomiting.

Emplastrum (*-tri, n. neu.*) A plaster.

Enema (*-atis, n. neu.*) An enema or clyster.

Et (*conj.*) And.
Extractum (*-i, n. neu.*) An extract.
F.=Fac. (*facio, feci, factum, facere, imp. m., 2nd p. s.*) Make.
Facies (*-ei, n. f.*) The face.
Febris (*-is, n. f.*) Fever.
Febricula (*-æ, n. f.*) Fever.
Fer=Ferrum. (*-i, n. neu.*) Iron.
Ferv=Fervens. (*-ens, -ens, -entis, adj.*) Hot.
Flatus (*-us, n. masc.*) Flatulence.
Flavus (*-us, -a, -um, adj.*) Yellow.
Flos (*-oris, n. masc.*) A flower.
Fol.=Folium (*-ii, n. neu.*) A leaf.
Frigidus (*-a, -um. adj.*) Cold.
Frequenter (*adv.*) Frequently.
Ft.=Fiat. (*fio, factus. fieri. pres. sub. 3rd s.*) Let it be made.
Ft.=Fiant. (,, ,, ,, ,, ,, *pl.*) Let them be made
Garg.=Gargarisma. (*-matis, n. neu.*) A gargle.
Genu (*-us, n. neu*). The knee.
Gradatim (*adv.*) By degrees.
Gr.=Granum. (*-i, n. neu.*) A grain.
Gtt.=Gutta. (*-æ, n. f.*) A drop.
Guttat.=Guttatim. (*adv.*) By drops.
H.=Hora. (*-æ, n. f.*) An hour.
Haust.=Haustus. (*-us, n. masc.*) A draught.
Hebdomas (*-adis, n. f.*) A week.
Heri (*adv.*) Yesterday.
Hodie (*adv.*) To-day.
Hora (*-æ, n. f.*) An hour.
H.S.S.=Hora Somni Sumendum. To be taken at bed-hour.
Idem (*Idem, eadem, idem, pron.*) The same.
In (*prep. gov. abl. or acc.*) In or into.
In d.=In-dies. (*adv.*) From day to day or daily.
Injectio (*-onis, n. f.*) An injection.
Infra (*prep. gov. acc.*) Below.
Infrico (*-cui, -ctum*, and *-catum, -are.*) To rub in.
Infusum (*-i, n. neu.*) An infusion.
Intime (*adv.*) Thoroughly.

Jecur (*jecoris, n. neu.*) The liver.
Latus (*-eris, n. neu.*) The side.
Laxativus (*-us, -a, -um, adj.*) Laxative.
Levis (*-is, -is, -e, adj.*) Light.
Libra (*-æ, n. f.*) A pound.
Lin. = Linimentum. (*-i, n. neu.*) A liniment.
Liquidus (*-us, -a, -um, adj.*) Liquid.
Liquor (*-oris, n., mase.*) A liquid.
Lytta (*-æ, n. f.*) Cantharides.
Lotio (*-onis, n. f.*) A lotion.
Macero (*-avi, -atum, -are.*) To macerate.
Mag. = Magnus. (*-us, -a, -um, adj.*) Large.
Mane (*indeel. neu. n.—used adverbially.*) In the morning.
Mane Primo (*adv.*) Very early in the morning.
M. = Massa. (*-æ, n. f.*) A mass.
M. = Misce (*miseeo, miseui, mistum, miseere, pres. imper.*) Mix.
M. or Min. = Minimum (*-i, n. neu.*) A minim.
Med. = Medieamentum (*-i, n. neu.*) A medieine.
Medius (*-us, -a, -um, adj.*) Middle.
Mensura (*-æ, n. f.*) A measure or by measure.
Meridies (*-ei, n. mase.*) Mid-day or noon.
Mist. = Mistura (*-æ, n. f.*) A mixture.
Mitte (*mitto, misi, missum, mittere, 2nd p. s. pres. imper.*) Send.
Modicus (*-us, -a, um, adj.*) Middle-sized.
Mol. = Mollis (*-e, adj.*) Soft.
More dict. = More dicto. (*more, mos, -ris, n. mase.; dicto, dico, -xi, -etum, -ere, participle.*) In the manner directed.
More sol. = More solito. (*solitus sum, solere, v. neu. passive.* To be accustomed.) In the usual manner.
Morbus (*-i, n. mase.*) Disease,
M.P. = Massa Pilularis. A pill mass.
Nig. = Niger (*-ra, -rum, adj.*) Black.
Nisi (*conj.*) Unless.
Nox (*noctis, n. f.*) Night.
N.P. = Nomen Proprium. The proper name.
Nux (*nucis, n. f.*) A nut.
Octarius (*-ii, n. mase.*) A pint.
Oculus (*-i, n. mase.*) An eye.
Oleum (*-ei, n. neu.*) Oil.

Om.=Omnis (*-is, -is, -e, adj.*) All ; every.

Omn. Hor.=Omni Hora. (*-æ, n. f.*) Every hour.

Omn. Quadr. Hor.= Omni Quadrante Horæ. (*Quadrans, -tis. ab. f.*) Every quarter of an hour.

Ope=Opis (*-is, n. f. ab. s. Rule* ix.(*a*). By the aid of.

Optimus (*-us, -a, -um, adj.*) Best.

Opus (*operis, n. neu.*) Need or occasion.

Pars (*-tis, n. f.*) A part.

P. Æ.=Partes Æquales (*-is, -is, -e, adj.*) Equal parts.

Parvulus (*-us, -a, -um, adj.*) Very little,

Paul=Paululus, (*-us, -a, -um, adj.*) Little.

Parvus (*-us, -a, -um, adj.*) Little ; small.

Pectus (*-oris, n. neu.*) The breast.

Per (*prep. governs acc.*) Through.

Pes (*pedis, n. masc.*) The foot.

Pil.=Pilula (*-æ, n. f.*) A pill.

Pocul=Poculum (*-i, n. neu.*) A cup—a little cup.

Pollex (*-icis, n. masc.*) The thumb.

Pone (*prep. gov. acc.*) Behind.

Post (*prep. gov. acc.*) After.

Postea (*adv.*) Afterwards.

P. P. A.=Phiala prius agitata (*ablative absolute*) The bottle having been first shaken.

Prandium (*-ii, n. neu.*) Dinner.

Primus (*-us, -a, -um, adj.*) First.

P. R. N.=Pro re nata (*adverbial phrase*). Occasionally, or according to circumstances.

Pro (*prep. gov. abl.*) Before.

Pulmo (*-onis, n. masc.*) A lung.

Pulv.=Pulvis (*-veris, n. masc.*) A powder.

Q. Q.=Quaque *f.* or Quoque *masc.* (*quisque, quæque, quodque, abl. s. indef. pron.*) Each or every.

Q. S. { = Quantum (*adv.*) / Sufficiat. (*sufficio, -feci, -fectum, -ere,*) } As much as is sufficient.

Quaque Hora (*abl. of quisque, quæque, quodque, pron.*) Each hour.

Quartus (*-us, -a, -um, adj.*) Fourth.

Quintus (*-us, -a, -um. adj.*) Fifth.

Quor.=Quorum (*qui, quæ, quod, pron.*) Of which.

Quater (*adv.*) Four times.
Quibus (*qui, quæ, quod, rel. pron. ab. pl.*) From which.
Quotidie (*adv.*) Daily.
R. = Recipe (*recipio, recepi, receptum, recipere, im. m.*) Take thou.
Rad. = Radix (*-icis, n. f.*) A root.
Rec. = Recens (*-ens, -ens, -ens, adj.*) Fresh.
Repet. { Repetatur (*repeto, -ivi, -itum, -ere, sub. m. 3rd s.*) } Let it be repeated.
Repetantur (*3rd pl.*) } Let them be repeated.
S.A. = Secundum Artem (*secundum, prep.; ars, artis, n. f.*) According to art.
Sæpe (*adv.*) Often.
Scrupulus (*-i, n. masc.*) A scruple.
Secundus (*-us, -a, -um, adj.*) Second.
Sem. = Semen (*-inis, n. neu.*) Seed.
Semiuncia (*-æ, n. f.*) A half-ounce.
Separatim (*adv.*) Separately.
Sesquih = Sesquihora (*sesquihora, -æ, n. f.*) An hour and a half.
Sextus (*-us, -a, -um, adj.*) Sixth.
Si (*conj.*) If.
Sig = Signa. (*signo, -avi, -atum, -are, im. m.*) Mark thou.
Simul (*adv.*) Together; at the same time.
Sine (*prep.*) Without (*gov. abl.*)
Sing = Singulorum (*singulus, -a, -um, adj.*) Of each.
Si op. sit = Si opus sit. If necessary.
Sit (*sum, fui, esse, p. sub.*) Let it be.
S.N. = Secundum Naturam (*-a, -æ, n. f.*) According to nature.
Solve (*solvo, solvi, solutum, solvere.*) Dissolve.
Somnus (*-i, n. masc.*) Sleep.
Spt. = Spiritus (*-us, n. masc.*) Spirit.
Ss. = Semis (*-is, -issis, n. masc.*) A half.
S. S. = Statim Sumendum. To be taken immediately.
St. = Sumat. (*sumo, sumpsi, sumptum, sumere, pr. sub.*) Let him take.
Stat. = Statim. (*adv.*) Immediately.
Sub. (*prep. gov. acc. or abl*) Under.
Subinde (*adv.*) Frequently.
Suc. = Succus (*-i, n. masc.*) Juice.
Sum. = Sume (*sumo, sumpsi, sumptum, sumere, im. m.*) Take.
Super (*prep. gov. acc. or abl.*) Over.
Supra (*prep. gov. acc.*) Above.
Syrupus (*-i. n. masc.*) Syrup.
Talis (*talis, talis, tale, adj.*) Such.
Ter (*adv.*) Thrice.

Tere (*tero, trivi, tritum, terere, im. m.*) Rub.
Tertius (*-us, -a, -um, adj.*) Third.
Thorax (*-acis, n. masc.*) The chest.
Tr. or Tinct.=Tinctura (*-æ, n. f.*) A tincture.
Trit.=Tritura (*tritura, triturare, im. m.*) Triturate. Grind.
Tussis (*-is, n. f.*) A cough.
Una (*adv.*) Together.
Uncia (*-æ, n. f.*) An ounce.
Ungt.=Unguentum (*-i, n. neu.*) An ointment.
Unus (*-a, -um, adj.*) One.
Ut Dict. } =Ut Dictum. As directed.
Utend. } =Utendum. (*-us, -a, -um, gerundive.*) To be used.
Vac. Ven.=Vacuo Ventriculo (*adj. & n., ab. sing. Rule* ix. (*a.*) On an empty stomach.
Vel (*conj.*) Or.
Vena (*-æ, n. f.*) A vein.
Venenum (*-i, n. neu.*) Poison.
Ver=Verus. (*-us, -a, -um, adj.*) Genuine.
Vesicatorius (*-us, -a, -um, adj.*) Blistering.
Vesp=Vesper (*-eris, n. masc.*) The evening.
Vetus (*-us, -us, -us, adj.*) Old.
Vices (*n. f. defective.*) Time.
Viginti (*numeral adj. indec.*) Twenty.
Vinum (*-i, n. neu.*) Wine.
Virus (*-i, n. neu.*) Poison.
Vitellus (*-i, n. masc.*) Yolk (*i.e.* of egg).
Vomicus (*-us, -a, -um, adj.*) Nauseating.
Vomitus (*-us, n. masc.*) Vomiting.
Vulnus (*-eris, n. neu.*) A wound.

PRESCRIPTION READING.*

The autograph prescriptions on the following left-hand pages, with their translation into unabbreviated Latin and English on the right-hand pages, will give the student a better idea of how he should write a receipe than the perusal of a volume of printed formulæ.

* Those who wish to study the *difficulties* of prescription reading should consult Mr. Proctor's book on Pharmacy, which contains a valuable selection of autograph prescriptions.

1, Fisherwick Place,
Belfast.

Mr ——

℞ Iridin 8r j
Pulv. Ipecac. 8r ¼
Ext. Nucis Vom. 8r ¼
Pil. Coloc. et Hyos. 8r iii ft
(Dcaurentur)
ft. pil. - mit. vi tales -
Cap. i h. s.
2

℞ Inf. Sen. C 3vij
Tinct. Gus.
Mannæ opt.
Magn. sulph. ān 3iv ft
ft. Mist - aperiens - Cap. Cy -
Mag - M - Seq - Vac. ventric
H. S. H
Nov - 25 - 84.

Mr.———

Recipe.

Iridin granum unum.
Pulveris Ipecacuanhæ quadrantem grani.
Extracti Nucis Vomicæ quadrantem grani.
Pilulæ Colocynthidis et Hyoscyami grana tria.
misce.

Fiat Pilula, mitte tales sex (dcauventur). Capiat unam horâ somni.

Recipe.

Infusi Semnæ Compositi uncias sex cum semisse.
Tincturæ Ejusdem semiunciam.
Mannæ Optimæ.
Magnesii Sulphatis ana drachmas quatuor.
misce.

Fiat mistura aperiens. Capiat cyathum magnum mane sequente vacuo ventriculo.

Nov. 25th, '81.

H. S. F.

Take

1 grain of Iridin.
¼ grain of Powder of Ipecacuanha.
¼ grain of Extract of Nux Vomica.
3 grains of Pill of Colocynth and Hyoscyamus.
mix.

Make a pill. Send six such (pills). Let them be gilded. Take one at bed-hour.

Take

6½ ounces of Compound Infusion of Senna.
½ ounce of the Tincture of the same.
4 drams of best Manna.
4 drams of Sulphate of Magnesium. mix.

Make an aperient mixture. Take a large glassful the following morning on an empty stomach.

Nov. 25th, '81.

H.S.F.

℞. Acid. Sulph. Dil 3ß
Quin. Sulph. Gr x ii
Liq. Morph. Hydrochlor. 3j
Aq. Cinn @ 3vi
M
Sign. 3ß & cyath vin. duo
aq. quart. quaque hora

℞. Lini Chloroform 3ii
Sign. — applic. ope. lint. et
ter. die. mane noctuque.

J. Cumming.

Nov. 26th 1881.

Recipe

Acidi Sulphurici Diluti semiunciam.
Quininæ Sulphatis grana duodecim.
Liquoris Morphinæ Hydrochloratis drachmam unam.
Aquæ Cinnamomi ad uncias sex.

misce.

Signa, semiunciam ex cyathis vinariis duobus aquæ quarta quaque hora.

Recipe

Linimenti Chloroformi uncias quatuor.

Signa, "Applicandum ope lintei et serici oleati mane noctequc."

J. Cuming.

Nov. 26th, '81.

Take

½ ounce of Diluted Sulphuric Acid.
12 grains of Sulphate of Quinine.
1 dram of Solution of Hydrochlorate of Morphine.
Cinnamon Water to 6 ounces.

mix.

Mark it, "Half an ounce (one tablespoonful) in two wineglassfuls of water every fourth hour."

Take

4 ounces of Liniment of Chloroform.

Mark it, "To be applied by the aid of lint and oiled silk morning and night."

J. Cuming.

Nov. 26th, '81.

3. Glengall Place,
Belfast.

Mrs Crawford

℞ Ferri Arseniat. gr. 1

— Redact.

Sulph. Quiniæ ān. 3ß

Ex. Nucis Vom. gr. iv

Divid. in pil xvj

Sumat j bis indies

post cib. ut dictum

23. Mch.

Mrs. Crawford,

Recipe

Ferri Arseniatis granum unum.

Ferri Redacti,

Quiniæ Sulphatis, ana semidrachmam.

Extracti Nucis Vomicæ grana quatuor.

misce.

Divide in pilulas sedecim. Sumat unam bis indies post cibos ut dictum.

J.W.T.S.

23rd March.

Take

1 grain of Arseniate of Iron.

Reduced Iron,

Sulphate of Quinia (or Quinine), of each half a dram.

4 grs. of Extract of Nux Vomica.

mix.

Divide into sixteen pills.

Take one twice a day after meals as directed.

J.W.T.S.

23rd March.

Mr ——

℞ Potassæ Hyd. ℥ij ℘

Vini Ipecac ℥ii

Tinct. Columbæ ℥ℌ

Aquæ ℥iv ℘

Syrupi ℥ß m

℈ mist. a teaspoonful

twice daily in water

after food A.J.

2/12/81~

Mr.——

Recipe

Potassæ Hydriodatis drachmam unam cum semisse.

Vini Ipecacuanhæ drachmas duas.

Tincturæ Calumbæ semiunciam.

Aquæ uncias quatuor cum semisse.

Syrupi semiunciam. *misce.*

Fiat mistura. *A.G.*

2/ 12/ '81.

Take

1½ drams of Hydriodate of Potash.

(1½ drams of Iodide of Potassium).

2 drams of Ipecacuanha Wine.

½ ounce of Tincture of Calumba.

4½ ounces of Water.

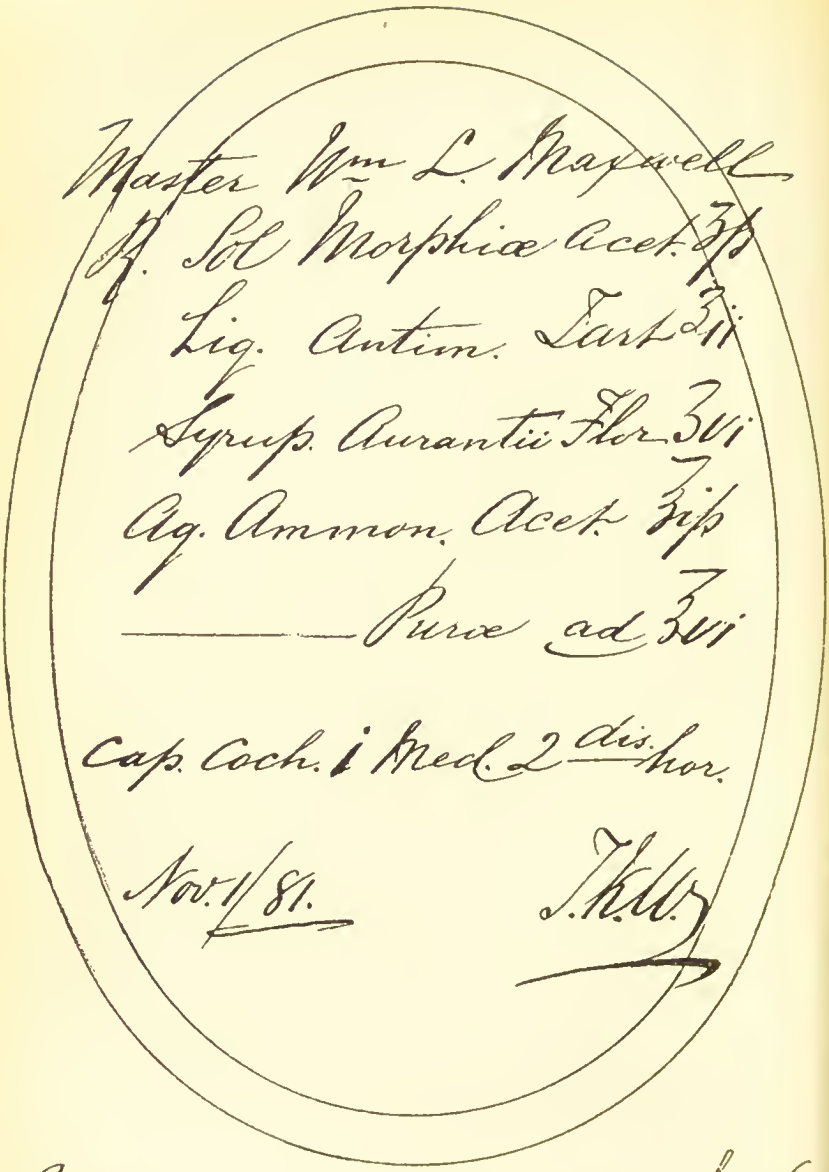
½ ounce of Syrup. mix.

Make a mixture.

A teaspoonful twice daily in water after food.

A.G.

2/ 12/ '81.


Master Wm L. Maxwell

℞ Sol Morphiæ Acet. ℥ß

Liq. Antim. Tart ℥ii

Syrup. Aurantii Flor ℥vi

Aq. Ammon. Acet. ℥ß

——— Puræ ad ℥vi

Cap. Coch. i Med. 2 dis. hor.

Nov. 1/81. J.K.D.

Mitte Emp. Vesicat. h. f. et
M reg. Cord. applic.

Master W. L. Maxwell.

Recipe

Solutionis Morphiæ Acetatis semidrachmam.

Liquoris Antimonii Tartarati drachmas duas.

Syrupi Aurantii Floris drachmas sex.

Aquæ Ammonii Acetatis unciam unam cum semisse.

Aquæ Puræ ad uncias sex.

misce.

Capiat cochleare unum medium secundis horis.

T.K.W.

Mitte Emplastrum Vesicatorium hujus formæ et magnitudinis regioni cordis applicandum.

Nov. 1st, 1881.

Take

½ dram of Solution of Acetate of Morphia (or Morphine).

2 drams of Solution of Tartarated Antimony.

6 drams of Syrup of Orange Flower.

1½ ounces of Water of Acetate of Ammonium.

Pure Water to 6 ounces.

mix.

Take a dessert-spoonful every second hour.

T.K.W.

Nov. 1st, 1881.

Send a blister of this shape and size, to be applied over the region of the heart.

14, Saville Row,
London.

℞ Foliorum uvæ ursi
3ss
aquæ destillatæ
ferventis ℥ix
Macera per horas tres
deinde coque leni
calore ad ℥viii et
cola. Adde liquori
colato
Tinct. Hyoscyami ℥j
fiat mistura cujus
sumat partem tertiam
ter quotidie

B C Brodie
Maii 4 1856
Mr Goskar.

Take of

Bearberry Leaves,

Half-an-ounce.

Hot Distilled Water,

Nine ounces.

Macerate for three hours.

Then boil to eight ounces with a gentle heat, and strain.

Add to the strained liquid,

One dram of

Tincture of Henbane.

Make a mixture,

Of which let a third part be taken three times a day.

(Signed).

B. C. Brodie.

4th May, 1856.

Mr. Goskar.

℞ Euonymin ℈ii
M. p. Hyos. ℈ii
— — Tct. C. ℈ii ℔

Mitte viii — Cpt unam 2da
q.q. nocte h. s —

℞ Sul. Magnesiæ ℥ii
— Quininæ ℥i
Syrupi Aurantii ℥ii
Tincturæ Lennæ C. ℥ii
Aquæ Pur. ad ℥iv ii
Tinct. Digit. ℥i ℔

Cpt. ℥ß (p. p. a) om. primo mane meridieque — hora c. semisse ante cibum —

℞ Spiritus Camphorati ℥ii
Olei Camphorati ad ℥vi
Tinct. — Thebaicæ ℥i ℔

℥ß (p. p. a) bene infricandam infra genu sinistrum om. nocte — 28/6/81 — A. K. J.

Recipe.

Euonymin grana duo.
Massæ Pilulæ Hydrargyri grana duo.
Massæ Pilulæ Colocynthidis Compositæ grana duo.

misce.

Mitte octo—capiat unam secunda quaque nocte hora somni.

Recipe

Sulphatis Magnesiæ uncias duas.
Sulphatis Quininæ drachmam unam.
Syrupi Aurantii uncias duas.
Tincturæ Sennæ Compositæ uncias duas.
Aquæ Puræ ad uncias duodecim.
Tincturæ Digitalis drachmas duas.

misce.

Capiat semiunciam (phiala prius agitata) omni primo mane meridieque, hora cum semisse ante cibum.

Recipe

Spiritus Camphorati uncias duas.
Olei Camphorati ad uncias sex.
Tincturæ Thebaicæ unciam unam.

misce.

Semiunciam (phiala prius agitata) bene infricandam infra genu sinistrum omni nocte.

A.K.Y.

28/ 6/ '81.

[OVER.

Take

2 grains of Euonymin.

2 grains of the pill mass of Mercury.

2 grains of the Compound pill mass of Colocynth.

mix.

Send 8 pills. Take one every second night at bed-hour.

Take

2 ounces of Sulphate of Magnesia.

1 dram of Sulphate of Quinine.

2 ounces of Syrup of Orange Peel.

2 ounces of Compound Tincture of Senna.

Pure Water to 12 ounces.

2 drams of Tincture of Digitalis. mix.

Take ½ oz. (the bottle having been first shaken) the first thing every morning, and every middle of the day one hour and a half before food.

Take

2 ounces of Camphorated Spirit.

Camphorated Oil to 6 ounces.

1 ounce of Tincture of Thebaica.* mix.

½ oz. (the bottle having been first shaken) to be well rubbed in beneath the left knee every night.

A.K.Y.

28/ 6/ '81.

* (Laudanum.) This word was used by the prescriber in order that the patient might not know that he was using a preparation of opium. It is obsolete.

GROUPS OF THERAPEUTIC AGENTS.

As the *junior* student will be frequently meeting in the Materia Medica portion of this work with words whose meaning he cannot understand, the following brief glossary is inserted here, not as an attempt to classify remedies, but merely for facility of reference, in order to explain terms in constant use which apply to many groups of well-known remedies.

There are *two* well recognised and often mentioned effects of a remedy—the Physiological and the Therapeutical—and the student should be familiar with both these terms.

By the Physiological action of a medicine is generally meant the effects which the medicine will produce when administered to a patient in *health;* though it should be remembered that to produce these effects a perfectly healthy state is not *necessary*. Thus, if 10 or 20 grs. of quinine be administered to a perfectly healthy subject, the constitutional effect of the remedy soon shows itself in the characteristic group of symptoms called cinchonism. This is spoken of as the Physiological or Primary action of quinine. If a medicinal dose of this drug be administered to a patient ill with the ague or neuralgia, it will be found to remove the disease; this is the Therapeutical or Secondary effect of the remedy. Suppose, however, the dose be a very large one; as in the first instance, the remedy may produce cinchonism, even though the patient have ague or neuralgia, and in this case the effects would still be called Physiological. It will thus be understood that, in administering a remedy in disease, the physician often desires it to be given in such a quantity that the *Physiological* effects of the drug should be made evident, as in treating syphilis with mercury, chorea with arsenic, paralysis with strychnine, or pertussis with belladonna.

To discuss the different theories which have from time to time prevailed about the way in which medicines produce their effects in the system, is beyond the intention of a short work like this. Under the name of each drug, in the Therapeutical part of this book, will be found a description of the way in which each is known or supposed to act. It will be hardly necessary to remind the student that the great bulk of remedies, after being swallowed, speedily find their way into the circulating fluid, accelerated or retarded by their crystalloid or

colloid nature, and the well-known laws of osmosis. By the blood they are carried to the different tissues or glands, upon which they produce their characteristic effects, and by which, in many instances, they are eliminated or thrown out of the body. Why they exercise their peculiar selective power over these particular tissues and organs is a question which, with our present knowledge, we can hardly attempt to explain.

Acids—Though these are always regarded as a group of remedies belonging to a chemical classification, the recent additions to our knowledge of the effects of acid substances justify the mention of them as a group in a Therapeutical list. They are medicines which, in the concentrated form, act mostly as caustics, and when given in medicinal doses possess the power of *checking the acid secretions* of the body with which they come in contact, and at the same time they directly *increase alkaline secretions*. It is by this theory that Ringer explains their use in acid dyspepsia, sweating, &c. The principal members of the group are hydrochloric, acetic, nitric, sulphuric, phosphoric, nitro-hydrochloric, citric, and benzoic acids.

Alkalies or Antacids—Under this head are included substances which have the power of *checking alkaline* and stimulating or *increasing acid secretions*. The most important are—caustic soda and potash, with their carbonates, bicarbonates, acetates, and citrates; ammonia, and magnesia, with their preparations. Of this class there are those which act *directly*, as soda does upon the gastric membrane, and those which also act indirectly through the blood, as potash affects the vesical mucous surface.

Alteratives are a class of remedies which, when administered, cure disease without producing any obvious impression on any of the organs of the body; and because the way in which they act is not understood, or capable of demonstration, in the present state of our knowledge, they are said to *alter* the morbid processes, and hence are called "Alteratives." The most important of this class are antimony, mercury, arsenic, iodine, and their preparations.

Anaphrodisiacs are medicines which weaken the sexual functions, as camphor, bromides of ammonium and potassium, and tobacco.

Anæsthetics are medicines which produce loss of sensation and consciousness from their effect upon the brain. The term is usually restricted to volatile substances like chloroform, ether, nitrous oxide gas, &c., and does not include narcotics like alcohol and opium, which likewise produce anæsthesia.

Anæsthetics (*Local*) are medicines which, when applied directly to a part, destroy its sensibility by their action on the sensory nerves, without injuring the tissues—as ether in the form of spray, cocaine, carbolic acid, ice, veratrine, &c.

Analgesics or Anodynes are remedies which relieve pain by their action on the brain, or their influence over the conductivity of the sensory nerve-fibre, as—opium, Indian hemp, belladonna, aconite, chloroform, &c.

Anhidrotics are medicines which restrain profuse perspiration. They act by their influence over the capillaries of the skin, mostly through the vaso-motor nerves—as belladonna, the vegetable and mineral astringents, and pierotoxine in small doses.

Antacids. (See Alkalies).

Anthelmintics, Vermifuges, or Antiscolics are medicines which destroy or cause the expulsion of worms, as santonin for the *round* worm, kousso, kamala, male-fern, turpentine, and pomegranate for the *tape* and *broad* worms, and injections of salt for the *thread* worm.

Antagonists are medicines which act in direct opposition to each other, as atropine and muscarine. They differ from

Antidotes, which are medicines that relieve or remove the symptoms caused by poisons. Antidotes are *chemical*, as lime for sulphuric acid; *physiological*, as strychnine for woorara; or *vital*, as mercury for syphilis.

Antilithics or Lithontriptics are medicines supposed to possess the power of dissolving various concretions in the body, as the acids for phosphatic, and the alkalies for the uric acid calculi; and Castile soap and salicylate of soda for gall-stones.

Antiparasitics are medicines which destroy minute parasites—as sulphurous and carbolic acids, iodide of sulphur, and various mercurial salts.

Antiperiodics are medicines which antagonise the poison of periodic disorders like ague. The principal members of the group are quinine, arsenic, iodine, and beberine.

Antiphlogistics are remedies which were supposed to possess the power of subduing inflammations—as mercury, antimony, venesection, &c.

Antiseptics are medicines which prevent putrefaction by destroying the germs causing it. Carbolic acid may be taken as the type of this class. They should not be confounded with Disinfectants like hot air, which destroy the germs caus-

ing disease, or with Deodorants like chlorine or charcoal, which destroy fetid smells and emanations.

Antisialics are remedies used to diminish or check the secretions of the salivary glands, as atropine, and physostigma.

Antipyretics are remedies which reduce the temperature in fevers. They do so either (1), by lessening the production of heat, through their effect on the nervous system; or (2), by destroying the poison which causes the fever; or (3), by their action on the skin or circulation; or (4), they may act by extracting the heat, as the cold bath does.

Quinine, digitalis, salicine, kairin, aconite, and the vegetable acids belong to this important group.

Antispasmodics—Several distinct groups of remedies are included under this heading.

(1) Medicines which *paralyse* the motor centres, as Calabar bean and woorara, or which merely *depress* them, as bromides of potassium and ammonium.

(2) Medicines which produce profound general depression of all the vital functions, as tobacco, aconite, lobelia, hellebore, prussic acid; and many remedies called sedatives.

(3) Medicines which, by stimulating the bowel, cause the expulsion of gas and relieve colic, as asafœtida, cajuput. castor, valerian, and a host of remedies called Carminatives and Aromatics.

Aphrodisiacs are medicines which excite the functions of the genital organs, as phosphorus, cantharides, strychnine, and damiana.

Astringents are remedies which cause contraction of muscular fibre, and condensation of the tissues, mostly by precipitation of gelatine and albumen. The most important are tannic and gallic acids, and all substances containing them, the mineral acids, and most metallic salts, alum, creasote, &c.

Carminatives. (See Antispasmodics.)

Cathartics, Aperients, Evacuants, or Purgatives are medicines which increase or quicken the evacuations from the bowel. They are variously sub-divided:—

a. Laxatives, which slightly quicken the peristaltic movements, and cause only *softened* motions, as manna, sulphur, figs, prunes, olive oil, &c.

b. Purgatives proper, which by increasing the movements of the intestines and stimulating the glands, cause *semi-fluid* motions, as senna, castor oil, mercurials, aloes, &c.

c. Drastics, which act like the former class, only more intensely, and by their local irritant action increase the intestinal fluid, and remove the serum from the intestinal vessels,

causing *almost fluid* motions—as scammony, jalap, colocynth, gamboge, podophyllin, and large doses of class *b*.

d. Hydragogues, which cause *free* secretion from the intestinal glands, and remove much serum from the blood vessels, producing *fluid* or *watery* motions, as croton oil, elaterin, and many of the remedies in class *c.*; and large doses of various salts, like cream of tartar, Epsom, Glauber, &c., which are often called *saline* purgatives, and which are supposed to act by virtue of their low diffusive powers.

e. Cholagogue purgatives, of which podophyllin may be taken as the type, are remedies which were supposed to purge by stimulating the liver, increasing the bile, and causing *greenish liquid* motions; most brisk purgatives are included in this class by writers.

Cholagogues. (See Cathartics.)

Ciliary Excitants are medicines which, when sucked in the mouth, promote expectoration of bronchial mucus by reflex action—as chloride of ammonium, chlorate of potassium, gum acacia, native chloride of sodium, &c.

Counter-Irritants—Under this heading are included—RUBEFACIENTS, remedies which cause redness of the skin; VESICANTS, which produce inflammation, ending in a blister being formed; REVULSIVES and DERIVATIVES, remedies which are supposed to remove the diseased action from the seat of mischief to the place of their application. Amongst this class are cantharides, turpentine, ammonia, camphor, mustard, most volatile oils, mezereon, capsicum, croton oil, &c.

Demulcents are medicines which protect the parts with which they come in contact, by their oleaginous or mucilaginous qualities shielding them from irritating secretions. Linseed, olive, and almond oils, starch, glycerine, liquorice, &c., are included under this head.

Diaphoretics are medicines which increase the cutaneous secretion, either by stimulating the sudoriferous glands during their elimination, as sulphur, or by causing the dilatation of the superficial capillaries, as antimony, ipecacuanha, and all depressing remedies.

Diluents are remedies like water and weak fluid foods, which, when taken in quantity, on being eliminated, carry out some solids with them by the kidneys, lungs, or skin.

Disinfectants and Deodorants are referred to under Antiseptics.

Diuretics are remedies which increase the renal secretion, either by (*a*) stimulating the kidneys during their elimination,

as cantharides, juniper, potash salts, &c.; or (*b*) by raising the blood pressure in the glomeruli, as digitalis, squill, casca, &c., &c.; or (*c*) by washing out the kidneys, as large doses of diluents, like water, &c.

Ecbolics are medicines which cause contraction of the uterine muscular fibre, as ergot, borax, savin, quinine, &c.; in smaller doses they are emmenagogue.

Emetics are medicines which cause the evacuation of the contents of the stomach, either *directly*, by irritating the nerves of the stomach, as sulphates of zinc and copper, mustard, &c.; or *indirectly*, by exciting the vomiting centre, as antimony, ipecacuanha, apomorphine, veratrine, &c.

Emmenagogues are medicines which, by their stimulating action on the uterine fibre, (1) directly assist in restoring disordered menstruation, as ergot, savin, and most ecbolics; or (2) by removing the cause of the suppression, allow the discharge to return, as iron, aloes, strychnine, &c.

Emollients or Protectives are external Demulcents, which protect and soothe the parts to which they are applied from all sources of irritation; or, by their oily nature, they help to relax and soften the tissues, as hot fomentations, poultices, oils, lard, spermaceti, chalk, starch, &c.

Errhines are medicines which increase the secretion of the nasal mucous membrane generally without causing sneezing, as the vapour of ammonia, acetic acid, &c.

Escharotics or Caustics are substances which destroy the life of the tissue to which they are applied, generally by depriving it of its moisture—as the strong mineral acids, soda, potash, lime, arsenic, chloride of zinc, &c.

Expectorants are medicines which assist the expulsion of the bronchial mucus—

(1) By relieving spasm of the bronchial tubes, as lobelia, opium, stramonium, tobacco, &c.

(2) By mechanically dislodging it in the act of vomiting, at the same time thinning the secretion, as all emetics *in large doses*, notably antimony, hippo, &c.

(3) By increasing the flow from the inflamed membrane, through their effects upon the vessels, as all the emetic class *in small doses*. (*Nauseating* expectorants—as apomorphine, pilocarpine, and emetine.)

(4) By stimulating the membrane in the act of their elimination, they so alter the secretion that expectoration is rendered easy, as ammonia, senega, ammoniacum, and a host of volatile substances, notably the onion. Iodide of potassium,

by liquefying the secretion, is a valuable expectorant. (*Stimulating* expectorants.)

(5) By soothing the irritable respiratory centre, morphine and chloral often act as true expectorants, and render the expulsion painless.

(6) By acting through the impression produced on the nerves of the mouth, many substances aid expectoration. (See Ciliary excitants, sal ammoniac, &c.)

Galactagogues are medicines which increase the secretion of the mammary glands, as chlorate of potassium, fennel, &c.

Hæmatics or Hæmatinics are medicines which enrich the blood by acting as restoratives to the red corpuscles, as iron and its preparations, manganese and potassium in small doses.

Hypnotics or Soporifics are medicines which produce sleep without causing any previous cerebral excitement.

Mydriatics are remedies which cause dilatation of the pupil, paralysis of the ciliary muscle, and temporary loss of accommodation, as belladonna, homatropine, daturine, &c.

Myotics are remedies which cause contraction of the pupil and diminution of ocular tension, as eserine, Calabar bean, pilocarpine, &c.

Narcotics are medicines which produce sleep by their action upon the cerebrum. They are to be distinguished by their initial exciting stage from pure Hypnotics, like chloral and bromide of potassium, &c.; amongst them are opium, morphine, chloroform, Indian hemp, alcohol, and ether.

Refrigerants are medicines which reduce the temperature of the body in fever; the term, however, is generally applied to a class of remedies which appear to allay thirst, as the vegetable acids, some mineral acids (much diluted), and many diaphoretics. (See Antipyretics.)

Resolvents or Discutients are medicines which are supposed to cause the absorption of inflammatory or other swellings. They appear to act by stimulating the lymphaties, as iodine, cadmium, &c.

Restoratives are medicines which exist already in the healthy blood or tissues, and are given in diseases where the system is supposed to be deficient in them, as iron, potash, phosphorus, chloride of sodium, &c.

Rubefacients. (See Counter-irritants.)

Sedatives or Depressants are medicines which depress the action of the (1) nervous system, as tobacco, lobelia,

bromide of potassium, &c.; (2) the circulatory system, as aconite, veratrum, Prussic acid, &c.; (3) the spinal cord, as Calabar bean, &c.

Sialagogues are medicines which increase the secretion of the salivary glands, either by a local irritation, causing reflex activity, as pellitory, mezereon, capsicum, &c.; or by exciting the glands during their elimination, as all the preparations of mercury, iodide of potassium, &c.

Sternutatories are substances which, by their irritating action on the nasal mucous membrane, cause sneezing, as tobacco, hellebore, ginger, capsicum, and ipecacuanha, in powder.

Stimulants*—Under this head may be included a great number of remedial agents. The sub-divisions are vague and misleading; thus there are medicines which excite the spinal cord, as strychnine, phosphorus, &c.; such are called spinal stimulants; others exalt the functions of the liver, as the cholagogue purgatives; others the intestines, as calomel, Epsom salt, &c.; others the circulatory system, as digitalis, belladonna, &c.; others the stomach, as carminatives, like spices, &c.; others the skin. These latter are called external stimulants, and include all the counter-irritants.

Stomachics are medicines which increase the vascularity of the stomach, promote digestion, and increase the appetite, as hippo, all the bitter tonics, arsenic, aloes in small doses, &c.

Styptics are medicines which arrest bleeding by their local astringent action, either by causing coagulation of the blood, or by acting on the muscular tissue of the small vessels. Amongst this class will be found tannic acid, creasote, alum, chloride of zinc, perchloride of iron, &c.

Sudorifics. (See Diaphoretics.)

Tonics are, strictly speaking, medicines which improve the tone of the part upon which they act; thus it may be on the stomach, as the pure vegetable bitters and all stomachics; or on the cord, as strychnine; or on the heart as digitalis; or on the nervous system, as quinine and the valerianates; or on the muscular tissues, as tannic acid; or on the circulating fluid, as iron.

Vesicants. (See Counter-irritants.)

* The term "stimulants" is frequently erroneously used as a synonym for alcohol and its preparations, which are true narcotics.

PART III.

MATERIA MEDICA.

PHARMACOPŒIAL PREPARATIONS.*

THE student having obtained some idea of the general processes of Pharmacy, should now glance at the groups of the preparations; but until he has mastered the Official Remedies he cannot expect to grasp all the information contained in this part of the subject; and hence, since these groups are of vital importance, he should repeatedly turn back to them during his study of the Materia Medica.

The Aceta or Vinegars of the Pharmacopœia are three in number:—

Acetum (Vinegar) contains 5·41 per cent. real acetic acid.

Acetum Cantharidis—2 oz. cantharides, 2 oz. glacial acetic, and 18 oz. acetic acid.

Acetum Scillæ—2½ oz. squill to 1 pint diluted acetic acid.

It will thus be noticed that the first is simply vinegar, the second a solution of cantharidine, in *strong* acetic acid, and the third a tincture of squill, made with *diluted* acetic acid.

Aquæ (The Waters—Sixteen in number), viz.:—

Aqua—Pure natural water; filtered (if necessary).

Aqua Anethi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Anisi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Aurantii Floris—The water distilled from the fresh flowers of the bitter and sweet orange—Citrus Vulgaris, and Citrus Aurantium.

* These preparations are often called "Galenical" *(pertaining to Galen)* to distinguish them from those prepared from the extemporaneous formulæ of the physician, which are called "Magistral" (*because ordered by a magister or master of his profession*).

Aqua Camphoræ—A solution of camphor in water, about ½ gr. to 1 oz.

Aqua Carui—One gal. distilled from 1 lb. of fruit and 2 gals. of water.

Aqua Chloroformi—A solution of 1 dr. chloroform in 25 oz. water.

Aqua Cinnamomi—One gal. distilled from 1¼ lb. of bark and 2 gals. water.

Aqua Destillata—Perfectly pure H_2O distilled from a copper still.

Aqua Fœniculi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Laurocerasi—One pt. distilled from 1 lb. fresh leaves and 2½ pts. water, and made to contain ·1 per cent. real Hydrocyanic Acid.

Aqua Menthæ Piperitæ—One gal. distilled from 1½ dr. oil and 1½ gal. water.

Aqua Menthæ Viridis—One gal. distilled from 1½ dr. oil and 1½ gal. water.

Aqua Pimentæ—One gal. distilled from 14 oz. pimento and 2 gals. water.

Aqua Rosæ—One gal distilled from 10 lbs. fresh petals and 5 gals. water.

Aqua Sambuci—One gal. distilled from 10 lbs. fresh flowers and 5 gals. water.

It should be remembered that all the waters are distilled except three—Aqua, Aqua Camphoræ, and Aqua Chloroformi, and that their doses all range from ½ to 1 or 2 oz., except Aqua Laurocerasi, which contains Hydrocyanic Acid, and whose dose is only ½ to 2 drams.

Cataplasmata (Poultices—Six in number).

Carbonis—Wood charcoal ½ oz., bread crumb 2 oz., linseed meal 1½ oz., boiling water 10 oz.—1 in 28.

Conii—Hemlock juice 1 oz., linseed meal 4 oz., boiling water 10 oz.—1 in 15.

Fermenti—Beer yeast 6 oz., wheaten flour 14 oz., water at 100° 6 oz.—1 in 4⅓.

Lini—Linseed meal 4 oz., boiling water 10 ozs.—1 in 3½.

Sinapis—Mustard 2½ oz., linseed meal 2½ oz., boiling water 10 oz.—1 in 6.

Sodæ Chlorinatæ—Solution of chlorinated soda 2 oz., linseed meal 4 oz., boiling water 8 oz.—1 in 7.

Of the six poultices, all are made with linseed meal for the basis, corpus, or body, as it is called, except the yeast poultice, and in all boiling water is used, except in the yeast.

The most important point in connection with poultice-making is to be quick when once the process is started, and have the vessels warmed before beginning, and always spread the poultice on *flannel*.

Charta (Papers—Two in number).

Charta Epispastica—Consisting of white wax 4 oz., spermaceti 1½ oz., olive oil 2 oz., resin ¾ oz., cantharides 1 oz., water 6 oz.; digested in a water bath for two hours. Reject the watery portion, add Canada balsam ½ oz., and spread over slips of paper. It is a resinous solution of cantharidine spread upon paper.

Charta Sinapis—Paper smeared over with mustard in powder 1 oz., mixed with solution of gutta percha 2 oz. It should be dipped in tepid water before use.

Collodia (Collodions—3 in number).

Collodium—Pyroxylin 1, Ether 36, Spirit 12.

Collodium Flexile—Collodion 48, Canada Balsam 2, Castor Oil 1.

Collodium Vesicans—Blistering Liquid 20, Pyroxylin 1.

Confections (8 in number). The last four are Cathartic, the first four faintly Astringent. Confections are soft preparations of a pasty consistence, containing a medicine blended with some form of sugar, either to preserve it, or to make its administration more agreeable. Under this heading are included the old Conserves and Electuaries.

CONFECTIO.	COMPOSITION.	STRENGTH.	DOSE.
Opii	Compound powder of opium 1 part, syrup 3 parts ; mix.	1 in 40.	5 to 20 grs.
Piperis . . .	Powdered black pepper 2, powdered caraway fruit 3, honey 15 ; mix.	1 in 10	60 to 120 grs.
Rosæ Caninæ	Hips, free from seeds, 1, beaten, sifted, and added to sugar, 2.	1 in 3	1 to 4 drs.
Rosæ Gallicæ	Fresh red rose petals 1, beaten with sugar, 3.	1 in 4	1 to 4 drs.
Scammonii .	Scammony resin 48, ginger 24, oil of caraway 2, oil of cloves 1, syrup 48, honey 24 ; mixed, adding the oils last.	1 in 3	10 to 30 grs.
Sennæ . . .	Powdered senna 7 oz., powdered coriander 3 oz., figs 12 oz., tamarind 9 oz., cassia pulp 9 oz., prunes 6 oz., extract of liquorice 1 oz., sugar 30 oz., water q.s. to 75 oz. Boil the figs and prunes in 24 oz. water for 4 hours ; in this digest the cassia and tamarind for 2 hours ; sift, add the sugar and liquorice, dissolve, add the senna and coriander, and make up to 75 ozs.	1 in 11.	60 to 120 grs.
Sulphuris . .	Sulphur 4 oz., cream of tartar 1 oz., syrup of orange peel 4 fl. oz., tragacanth 18 grs. ; mix	1 in 2½.	60 to 120 grs.
Terebinthinæ	Oil of turpentine 1 oz., powdered liquorice 1 oz., honey 2 oz. ; rub the first two, add the last, and mix thoroughly.	1 in 4.	60 to 120 grs.

Decocta (Decoctions—13 in number) are watery vegetable solutions prepared by boiling. All are made in a covered vessel, except Granati. Three contain more than one solid ingredient. (All are made with distilled water and strained.)

DECOCTIONS.

DECOCTUM.	COMPOSITION.	STRENGTH.	DOSE.
Aloes Co. . .	Extract of socotrine aloes ½ oz., myrrh, saffron, and carbonate of potassium, of each ¼ oz., extract of liquorice 2 oz., compound tincture of cardamoms 15 oz., water q.s. to 50 oz. Boil all for 5 minutes, except the saffron and tincture, in 1 pint of water; add the saffron, and when cooled add the tincture 2 hours before straining, and make up to 50 oz. with water.	4·3 grains in 1 oz.	½ to 2 oz.
Cetrariæ . .	Washed Iceland moss 1 oz., boiled for 10 minutes in 1 pint water, strained while hot, and made to measure 1 pint.	1 oz. to 1 pt.	1 to 4 oz.
Cinchonæ . .	Powdered red bark 1¼ oz., Boiled for 10 minutes in 1 pint water, strained when cold, and made to measure 1 pint.	1¼ oz. to 1 pt.	1 to 2 oz.
Granati Radicis	Bark of pomegranate root 2 oz., boiled in water 40 oz., down to 1 pint.	2 oz. to 1 pt.	2 to 4 oz.
Hæmatoxyli.	Logwood chips 1 oz., and cinnamon 55 grs., boiled for 10 minutes in 1 pint water, and made to measure 1 pint.	1 oz. to 1 pt.	1 to 2 oz.
Hordei . . .	Washed barley 2 oz., boiled in water 1½ pint, for 20 minutes, and strained. Product about 1 pint.	2 oz. to 1 pt.	1 to 4 oz.
Papaveris. .	Bruised poppy capsules 2 oz., boiled for 10 minutes in 1½ pint water, and made to measure 1 pt.	2 oz. to 1 pt.	used externally.
Pareiræ. . .	Parcira root 1¼ oz., boiled for 15 minutes in 1 pint of water, and made to measure 1 pint.	1¼ oz. to 1 pt.	1 to 2 oz.
Quercus . . .	Oak bark 1¼ oz., boiled for 10 minutes in 1 pint water, and made to measure 1 pint.	1¼ oz. to 1 pt.	used externally.
Sarsæ. . . .	Sarsaparilla 2½ oz., digested in 1½ pint boiling water for 1 hour, then boiled for 10 minutes, and made to measure 1 pint.	2½ oz. to 1 pt.	2 to 10 oz.
Sarsæ Co. . .	Sarsaparilla 2½ oz., sassafras root, guaiacum wood and liquorice root, of each ½ oz., mezereon bark ⅛ oz., boiling water 1½ pint, digested for 1 hour, then boiled for 10 minutes, and made to measure 1 pint.	2½ oz. to 1 pt.	2 to 10 oz
Scoparii. . .	Dried tops of broom 1 oz., boiled for 10 minutes in 1 pint water, and made to measure 1 pt.	1 oz. to 1 pt.	2 to 4 oz.
Taraxaci . .	Dried, sliced, and bruised dandelion root 1 oz., boiled for 10 minutes in 1 pint water, strained, and made to measure 1 pint.	1 oz. to 1 pt.	2 to 4 oz.

Emplastra (Plasters—14 in number) are solid, adhesive applications for external use, either for support or intended to act as a local means of applying various active remedies. As the various ingredients are only added to the active medicine for the sake of such physical qualities as adhesiveness, softness, hardness, and the like, it is not necessary for the student to learn *their* proportions, and as the directions are complicated, and seldom required by the student of Pharmacy, who never makes them, he is referred to the name of the drug in the Materia Medica, where he will find the plasters amongst the other preparations of each remedy in the following pages, or he may consult the Pharmacopœia.

EMPLASTRUM.	ARTICLES EMPLOYED IN THE PREPARATION.	STRENGTH.
Ammoniaci *cum* Hydrargyro	Ammoniacum, mercury, olive oil, and sublimed sulphur.	1 of Hg in 5
Belladonnæ ..	Alcoholic extract of Belladonna, resin plaster, and soap plaster.	1 in 5.
Calefaciens ..	Cantharides, expressed oil of nutmeg, yellow wax, resin, resin plaster, soap plaster, and boiling water.	1 in 24 of Cantharides.
Cantharidis ..	Cantharides, yellow wax, suet, lard, and resin.	1 in 3.
Ferri	Peroxide of iron, Burgundy pitch, and lead plaster.	1 in 11.
Galbani ..	Galbanum, yellow wax, ammoniacum, and lead plaster.	1 in 11.
Hydrargyri ..	Mercury, olive oil, sulphur, and lead plaster.	1 in 3.
Opii	Powdered opium and resin plaster.	1 in 10.
Picis	Burgundy pitch, frankincense, resin, yellow wax, expressed oil of nutmeg, olive oil, and water.	1 in 2.
Plumbi	Oxide of lead, olive oil, and water. No strength need be given, as it is entirely *oleate of lead*, with a little glycerine.	
Plumbi Iodidi	Iodide of lead, lead plaster, and resin.	1 in 10.
Resinæ .. (Adhesive Plaster.)	Resin, lead plaster, and curd soap.	1 in $9\frac{1}{2}$.
Saponis ..	Curd soap, lead plaster, and resin.	1 in 7.
Saponis Fuscum	Curd soap, yellow wax, olive oil, oxide of lead, and vinegar.	1 in 6. (about.)

Enemata (Injections, Enemas, or Clysters—5 in number) are liquid preparations for introduction into the large bowel, where they may act either (1) as local sedatives, (2) by exciting reflex action they are expected to cause purgation, or (3) if used in very large quantity they act by washing out the bowel mechanically. (4.) They may be injected with the idea of becoming absorbed into the system, and producing the

constitutional effect the drug which they contain. Mucilage of starch is the basis of four, and water of one.

ENEMA.	ACTIVE PRINCIPLE.	BASIS.
Aloes	Aloes 40 grs., carbonate of potassium 15 grs.	Starch mucilage 10 oz.
Magnesii Sulphatis	Sulphate of magnesium 1 oz., olive oil 1 oz.	Starch mucilage 15 oz.
Opii	Tincture of opium ½ dr.	Starch mucilage 2 oz.
Terebinthinæ	Oil of turpentine 1 oz.	Starch mucilage 15 oz.
Asafœtidæ	Asafœtida 30 grs., rubbed in a mortar, with	Distilled water 4 oz.

Essentiæ (Essences—2 in number) are merely very strong spirits, consisting of a volatile oil dissolved in rectified spirit —one part in every five.

Essentia Anisi, 1 in 5, and Essentia Menthæ Pip., 1 in 5.

Extracta (Extracts—47 in number) are mostly semi-solid products, obtained by the evaporation of vegetable solutions.

There are five classes of extracts, if we divide them according to the methods directed for their preparation—

1. The Fresh or Green Extracts, as aconite, &c.
2. The Aqueous or Watery, as aloes and opium.
3. The Alcoholic, as physostigma and rhubarb.
4. The Ethereal, as mezereon.
5. The Liquid, as ergot and male fern.

The student should remember that these names have no connection with the *physical qualities* of the extract, except in the case of the Liquid ones. Thus, the Fresh or Green extracts are either dark brown or black in colour; the Watery extracts may be of pilular consistence—like opium, or hard and brittle—like logwood and aloes.

The extracts may be, however, better divided, according to their consistence, into three well marked groups—

1. The *Semi-solid* or pilular extracts, of which there are 30.
2. The *Hard*, Dry, or Brittle, of which there are 4.
3. The *Fluid*, of which there are 13.

The Fluid extracts will be found in the table on the page 138. The table on page 139 contains both the Solid and Semi-solid: but the student should remember that the Solid extracts are—Extractum Aloes Barbadensis, Aloes Socotrinæ, Hæmatoxyli, and Krameriæ.

PREPARATION OF EXTRACTS.

The Fresh or Green Extracts, of which there are eight, viz.:—

Aconite,	Hyoscyamus,	Lettuce,
Belladonna,	Colchicum,	Dandelion,
Hemlock,	Colchicum (acetic)	

are prepared by expressing the juice of the leaves or plant, heating to 130° F., to coagulate the green colouring matter. This is separated and laid aside. The fluid is heated to 200° F. to coagulate all the albumen, which is useless, and which if retained would promote the decomposition of the preparation; it is consequently rejected. The fluid resulting is evaporated by the heat of a water-bath to a syrupy state. The colouring, previously separated, is now added, and the evaporation continued below 140° till the consistence of a soft pill mass is reached. In the case of Colchicum and Dandelion the juice is at first heated to the boiling point to coagulate the albumen, filtered and evaporated at a temperature under 160°.

The Watery Extracts (11 in number) are prepared by boiling, macerating, infusing, or digesting the substance in hot or cold distilled water, and evaporating the resulting decoction, infusion, or solution to a suitable consistence. Thus Aloes Barb. and Aloes Socot., Gentian, Logwood, Parcira, are made by exhausting with *boiling* water; so also is Poppies, only a little spirit is added to the cold evaporated infusion. Chamomile is made by first boiling, hence it is an evaporated *decoction*, to which a little essential oil is added. Liquorice, Krameria, Opium, and Quassia are aqueous extracts prepared by maceration of the drug in *cold* water.

The Alcoholic Extracts (13 in number) are prepared by treating the substance with rectified spirit, proof spirit, or spirit and water, and the subsequent evaporation of the tincture thus prepared. The student should note that there are two semi-solid extracts of Belladonna, one a Green or Fresh extract and the other prepared with spirit and known as the Alcoholic extract. Gelsemium extract has the term Alcoholic affixed.

Belladonna, Indian Hemp, Gelsemium, Jalap, Nux Vomica, and Calabar Bean are made with *rectified* spirit, the percolation being generally finished by displacement with cold water. Hop is also made with *rectified* spirit, and the marc is boiled in water.

Rhubarb, Rhamnus Frangula, Jaborandi, Compound Coloeynth, Cascara, and Calumba are made with *proof* spirit, and cold water is also used at the end of the percolating process.

The Ethereal Extract, for there is, strictly speaking, only one—viz., mezereon—is prepared by first making an alcoholic extract, which is next macerated in ether, and the resulting liquid evaporated. Ether is also used in preparing stramonium, which, strictly speaking, is an *alcoholic* extract made with proof spirit after the mere washing of the seeds with ether to remove their oil, which is to be rejected. Ether is also used in making Male Fern, which is an extract belonging to the next class.

Liquid Extracts (13 in number) are either Alcoholic extracts dissolved in spirit and water, or *concentrated* infusions of drugs, to which enough spirit is added for their preservation. Pareira and Opium are made from the semi-solid extracts of these remedies which are, as described, prepared by exhausting the drug with water. The following table gives all these fluid preparations, with their strengths, doses, and the materials used in their manufacture :—

EXTRACTUM.	MATERIALS USED.	Strength.	DOSE.
Belæ Liq.	Bael fruit, water, and spirit.	1 in 1.	1 to 2 drs.
Casearæ Sagradæ Liq.	Cascara sagrada, water and spirit.	1 in 1.	½ to 2 drs.
Cimicifugæ Liq.	Cimicifuga and rectified spirit.	1 in 1.	3 to 30 min.
Cinchonæ Liq.	Red cinchona bark, hydrochloric acid, glycerine, spirit & water.	1 in 1, or 5 per cent. alkaloids.	5 to 10 min.
Coeæ Liq.	Coca leaves and proof spirit.	1 in 1.	½ to 2 drs.
Ergotæ Liq.	Ergot, water and spirit	1 in 1.	10 to 30 min.
Filicis Liq.	Male fern (dried rhizome), and ether.	10 yield 1.	15 to 30 min.
Glycyrrhizæ Liq.	Liquorice root, water and spirit.	1 in 2 of extract.	1 dr.
Opii Liq.	Extract of opium, water and spirit.	1 in 20. 22 grs to 1 oz	10 to 40 min.
Pareiræ Liq.	Extract of pareira, water and spirit.	1 in 4 of extract.	½ to 2 drs.
Rhamni Frangulæ Liq.	Rhamnus frangula bark water and spirit.	1 in 1.	1 to 4 drs.
Sarsæ Liq.	Jamaica sarsaparilla, proof spirit, sugar and water at 160°.	1 in 1.	2 to 4 drs.
Taraxaci Liq.	Dry dandelion root, proof spirit and water.	1 in 1.	½ to 2 drs.

Abstracts are alcoholic extracts mixed with sugar of milk, evaporated to dryness and powdered. They are not represented in the B.P.

EXTRACTUM.	SOURCE.	MENSTRUUM USED.	DOSE.
Aconiti	Juice of the fresh leaves and flowering tops.	None.	$\frac{1}{4}$ to 1 gr.
Aloes Barb.	Barbadoes aloes, in fragments.	Boiling water.	2 to 6 grs.
Aloes Socot.	Socotrine aloes, in fragments.	Do.	2 to 6 grs.
Anthemidis	The dried flowers and essential oil.	Do.	2 to 10 grs.
Belladonnæ	Juice of the fresh leaves and young branches.	None.	$\frac{1}{4}$ to 1 gr.
Bellad. Alcohol. ..	Dried belladonna root.	Spirit and water.	$\frac{1}{16}$ to $\frac{1}{4}$ gr.
Calumbæ	The sliced root, dried	Proof spirit.	2 to 10 grs.
Cannabis Indicæ..	The dried flowering tops.	Rectified spirit.	$\frac{1}{4}$ to 1 gr.
Cascaræ Sagradæ	The powdered bark ..	Proof spirit and water.	2 to 8 grs.
Colchici	Juice of the fresh corms.	None.	$\frac{1}{2}$ to 2 grs.
Colchici Acetic. ..	Do. do.	with acetic acid.	$\frac{1}{2}$ to 2 grs.
Colocynth. Comp..	Pulp of colocynth, extract of socotrine aloes, scammony resin, curd soap, and cardamoms.	Proof spirit.	3 to 10 grs.
Conii	Juice of fresh leaves and young branches.	None.	2 to 6 grs.
Gelsemii Alcohol..	The dried rhizome.	Spirit and water.	$\frac{1}{2}$ to 2 grs.
Gentianæ..	The sliced root, dried.	Boiling water.	2 to 10 grs.
Glycyrrhizæ	The dried powdered root.	Cold water.	5 grs. to 1 dr.
Hæmatoxyli	Dried logwood in chips.	Boiling water.	10 to 30 grs.
Hyoscyami	Juice of fresh leaves and branches.	None.	5 to 10 grs.
Jaborandi	The dried leaflets.	Proof spirit and water.	2 to 10 grs.
Jalapæ	The dried powdered root.	Rectified spirit and water.	5 to 15 grs.
Krameriæ	The dried powdered root.	Cold water.	5 to 20 grs.
Lactucæ	Juice of the flowering herb	None.	5 to 15 grs.
Lupuli	The dried strobiles	Rectified spirit and hot water.	5 to 15 grs.
Mezerei Æther. ..	The dried bark cut small.	Rectified spirit and ether.	Externally.
Nucis Vomicæ ..	The dried seeds, powdered after being steamed.	Rectified spirit and water.	$\frac{1}{2}$ to 2 grs.
Opii	Opium in powder.	Cold water.	$\frac{1}{2}$ to 2 grs.
Papaveris	Dried seedless capsules, powdered.	Boiling water and spirit.	2 to 5 grs.
Pareiræ	The dried powdered root.	Boiling water.	10 to 30 grs.
Physostigmatis ..	The dried powdered Calabar bean.	Rectified spirit.	$\frac{1}{16}$ to $\frac{1}{4}$ gr.
Quassiæ	The dried rasped wood.	Cold water.	3 to 5 grs.
Rhamni Frangulæ	The powdered bark	Proof spirit and water.	15 to 60 grs.
Rhei	The dried powdered root.	Cold water and proof spirit.	5 to 15 grs.
Stramonii	The dried, coarsely powdered seeds.	Ether and proof spirit.	$\frac{1}{4}$ to $\frac{1}{2}$ gr.
Taraxaci	The juice of the fresh root	None.	5 to 30 grs.

As regards doses, the student should remember that the extract of Calabar bean and *alcoholic* extract of belladonna should be given in doses of $\frac{1}{16}$ to $\frac{1}{4}$ gr.; stramonium, $\frac{1}{4}$ to $\frac{1}{2}$ gr.; the green extract of belladonna, aconite, and Indian hemp, $\frac{1}{4}$ to 1 gr.; whilst the doses of colchicum, nux vomica, and opium extracts should not exceed 2 grs.

Glycerina (Glycerines—8 in number) are solutions of the drug bearing the name, in glycerine or in glycerine and water. The fact of the solid constituents being weighed and the fluid ones being measured, leads to difficulties in stating accurately their strengths.

GLYCERINUM.	INGREDIENTS.	Strength by Weight.	Strength by Volume.
Acid. Carbolici ..	Carbolic acid and glycerine.	1 in 6.	1 in $4\frac{3}{4}$.
Acid. Gallici ..	Gallic acid and glycerine.	1 in 6.	1 in $4\frac{1}{2}$.
Acid. Tannici ..	Tannic acid and glycerine.	1 in 6.	1 in $4\frac{1}{2}$.
Aluminis	Alum and glycerine.	1 in $7\frac{1}{4}$.	1 in $5\frac{1}{2}$.
Amyli	Starch, glycerine and water.	1 in 10.	1 in 9.
Boracis	Borax, glycerine and water.	1 in 8.	1 in $6\frac{3}{4}$.
Plumbi Subacetatis	Acetate and oxide of lead, Glycerine and water. This latter is afterwards evaporated.	1 in 6.	1 in 4.
Tragacanthæ ..	Tragacanth, glycerine, and water.	1 in $5\frac{1}{2}$.	1 in $5\frac{2}{3}$.

Infusa (Infusions—28 in number) are watery solutions of vegetable principles prepared without boiling. 24 are prepared by pouring boiling distilled water on the vegetable properly comminuted, and placed in a suitable pot with a covered lid, and allowed to stand a definite short time. Two—Quassia and Calumba—are prepared with cold water, and two—Chiretta and Cusparia—with water at 120°. All will darken on the addition of persalts of iron, except Quassia and Calumba, and all should be prepared fresh. All are directed to be strained except kousso. The product should not be made to measure any particular quantity. The most important infusion for the student to remember is Digitalis. It contains 28 grs. to each 10 oz., and the dose is only two to four drams. All the infusions are made with 10 oz. water, except kousso, and only 8 oz. are ordered in it; 13 are made with $\frac{1}{2}$ oz. of the vegetable; 8 with $\frac{1}{4}$ oz.; linseed has 150 and catechu 160 grs.; gentian and quassia, 55 grs. each; while casearilla and senna contain 1 oz. each to every 10 oz.

INFUSIONS.

INFUSUM.	INGREDIENTS.	MENSTRUUM.	TIME.	DOSE.
Anthemidis	½ oz. flowers.	10 oz. boiling water	¼ hour.	1 to 4 oz.
Aurantii	½ oz. bitter-orange peel cut small.	10 oz. boiling water	¼ hour.	1 to 2 oz.
Aurantii Co.	½ oz. bitter-orange peel cut small. 56 grs. fresh lemon peel cut small. 28 grs. cloves bruised	10 oz. boiling water	¼ hour.	1 to 2 oz.
Buchu	½ oz. leaves bruised.	10 oz. boiling water	½ hour.	1 to 4 oz.
Calumbæ	½ oz. root cut small.	10 oz. *cold* water.	½ hour.	1 to 2 oz.
Caryophylli	¼ oz. cloves bruised.	10 oz. boiling water	½ hour.	1 to 4 oz.
Cascarillæ	1 oz. powdered bark.	10 oz. boiling water	½ hour.	1 to 2 oz.
Catechu	160 grs. pale catechu coarsely powdered 30 grs. cinnamon bark bruised.	10 oz. boiling water	½ hour.	1 to 2 oz.
Chiratæ	¼ oz. chiretta cut sml.	10 oz. water at 120°.	½ hour.	1 to 2 oz.
Cinch. Acid.	½ oz. red bark in No. 40 powder. 1 dr. aromatic sulphuric acid	10 oz. boiling water	1 hour.	1 to 2 oz.
Cuspariæ	½ oz. bark in No. 40 powder.	10 oz. water at 120°	1 hour.	1 to 2 oz.
Cusso	½ oz. kousso coarsely powdered.	8 oz. boiling water.	¼ hour.	4 to 8 oz.
Digitalis	28 grs. dried leaves.	10 oz. boiling water	½ hour.	2 to 4 drs
Ergotæ	½ oz. coarsely powdered.	10 oz. boiling water	½ hour.	1 to 2 oz.
Gentianæ Co.	55 grs. root sliced, 55 grs. bitter-orange peel cut. ¼ oz. fresh lemon peel cut.	10 oz. boiling water	½ hour.	1 to 2 oz.
Jaborandi	½ oz. dried leaflets.	10 oz. boiling water	½ hour.	1 to 2 oz.
Krameriæ	½ oz. root powdered.	10 oz. boiling water	½ hour.	1 to 2 oz.
Lini	150 grs. of the seeds, 50 grs. dried liquorice root in No. 20 powder	10 oz. boiling water	2 hours.	2 to 6 oz.
Lupuli	½ oz. dried strobiles.	10 oz. boiling water	1 hour.	1 to 2 oz.
Maticæ	½ oz. leaves cut small.	10 oz. boiling water	½ hour.	1 to 4 oz.
Quassiæ	55 grs. wood chips.	10 oz. *cold* water.	½ hour.	1 to 2 oz.
Rhei	¼ oz. root in thin slices.	10 oz. boiling water	½ hour.	1 to 2 oz.
Rosæ Acidum	½ oz. dried red rose petals. 1 dr. dilute sulphuric acid.	10 oz. boiling water	½ hour.	1 to 2 oz.
Senegæ	½ oz. root powdered.	10 oz. boiling water	½ hour.	1 to 2 oz.
Sennæ	1 oz. senna & 28 grs. ginger sliced.	10 oz. boiling water	½ hour.	1 to 2 oz.
Serpentariæ	½ oz. rhizome powd'rd	10 oz. boiling water	½ hour.	1 to 2 oz.
Uvæ Ursi	½ oz. leaves bruised.	10 oz. boiling water	1 hour.	1 to 2 oz.
Valerianæ	½ oz. rhizome bruised	10 oz. boiling water	1 hour.	1 to 2 oz.

There are 7 Infusions which are really compound preparations, containing more than one ingredient; they are—Aurantii Co., Catechu, Cinchonæ Acid., Gentianæ Co., Lini, Rosæ Acid., and Sennæ, though the student will note that the title compound is only conferred upon two of them—viz., Gentian and Orange. The new Pharmacopœia, in addition to shortening the time for the majority of the infusions, has reduced the strength of Digitalis from 3 grs. to 2·8 grs. per oz., and has also added acid to cinchona, and given more minute directions for the comminution of the substances previous to infusion.

Injectio Hypodermica.—There are 3 preparations under this head in the Pharmacopœia.

HYPODERMIC INJECTIONS.

INJECTIO HYPODERMICA.	COMPOSITION.	STRENGTH.	DOSE.
Apomorphinæ	Hydrochlorate of apomorphine, 2 grs.; camphor water, 100 minims.	1 in 50.	2 to 8 mins.
Ergotini ..	Ergotin, 100 grs.; camphor water 200 grs.	1 to 2.	3 to 10 mins.
Morphinæ ..	Hydrochlorate of morphine, 92 grs.; solution of ammonia, acetic acid; and water, q. s. to 2 ozs.	1 gr. acetate in 10 mins.	1 to 6 mins.

Lamellæ (Discs) are 3 in number—

Lamellæ Atropinæ—Discs of gelatine and some glycerine, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{5000}$ gr. sulphate of atropine.

Lamellæ Cocainæ—Discs of gelatine, with some glycerine, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{2000}$ gr. hydrochlorate of cocaine.

Lamellæ Physostigminæ—Discs of gelatine, with some glycerine, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{10000}$ gr. physostigmine.

Linimenta (Liniments or Embrocations—16 in number) are preparations for external application to the skin, and intended to be applied with friction. They are really very thin ointments, though the majority of them are perfectly limpid liquids. The iodide of potassium with soap liniment, is a soft solid—like shaving paste. Of the 16, all contain either a fixed or volatile oil or a soap, except Lin. Iodi. camphor entering into 11 of them. Those without camphor are ammonia, lime, iodine, croton oil, and iodide of potassium with soap.

LINIMENTUM.	COMPOSITION.	STRENGTH.
Aconiti	20 oz. root, 1 oz. camphor, and 30 oz. rectified spirit.	1 in 1½.
Ammoniæ ..	1 oz. solution of ammonia, and 3 oz. olive oil.	1 in 4.
Belladonnæ ..	20 oz. root, 1 oz. camphor, and 30 oz. rectified spirit.	1 in 1½.
Calcis..	2 oz. lime water, and 2 oz. olive oil, agitated together.	1 in 2.
Camphoræ ..	1 oz. camphor, dissolved in 4 oz. olive oil.	1 in 5.
Camphoræ Co.	2½ oz. camphor, 1 dr. oil of lavender, 5 oz. strong solution of ammonia, and 15 oz. rectified spirit.	1 in 9.
Chloroformi ..	2 oz. chloroform, and 2 oz. camphor liniment.	1 in 2.
Crotonis	1 oz. croton oil, and 3½ oz. each oil of cajuput and rectified spirit.	1 in 8.
Hydrargyri ..	1 oz. each of mercurial ointment, solution of ammonia, and liniment of camphor, rubbed together.	1 of oint. in 3, or 1 of Hg. in 6.
Iodi	1¼ oz. iodine, ½ oz. iodide of potassium, ¼ oz. glycerine, dissolved in 10 oz. rectified spirit.	1 in 9.
Opii	2 oz. tincture of opium, and 2 oz. soap liniment.	1 in 2.
Potassii Iodidi cum Sapone	2 oz. curd soap, 1½ oz. iodide of potassium, 1 oz. glycerine, 1 dr. oil of lemon, and 10 oz. distilled water.	54½ grs. in 1 fl. oz. *or* 1 in 10 by weight.
Saponis	2 oz. hard soap, 1 oz. camphor, 3 drs. oil of rosemary, 4 oz. distilled water, and 16 oz. rectified spirit.	1 in 12.
Sinapis Co. ..	1 dr. oil of mustard, 40 grs. ethereal extract of mezereon, 120 grs. camphor, 5 drs. castor oil, and 4 oz. rectified spirit.	1 in 40.
Terebinthinæ	2 oz. soft soap, 1 oz. camphor, 16 oz. oil of turpentine, and 2 oz. water.	4 in 5.
Terebinth. Acet.	4 oz. oil of turpentine, 1 oz. glacial acetic acid, and 4 oz. camphor liniment.	4 in 9.

Liquores (Solutions—48 in number) are solutions of vegetable principles or inorganic substances, mostly in distilled water. One—Epispasticus—comes from the animal kingdom, and is made with acetic ether. Antim. chlorid. is made with hydrochloric acid, gutta-percha is dissolved in chloroform, ethylate of sodium in alcohol, and atropine sulph. in camphor water. All the rest are made with water or distilled water.

The following nine are of the same strength, and are important preparations, containing 1 per cent. each of active ingredient :—Arsenicalis, Arsenici Hydrochlorieus, Arsenii et Hydrarg. Iod., Atropinæ Sulphatis, Morphinæ Acetatis, Morphinæ Hydrochlor., Pot. Permang., Sodii Arseniatis, and Strychninæ.

LIQUOR.	STRENGTH.	DOSE.
Acid. Chromici	25 p. cent. anhydrous.	Used externally.
Ammoniæ	1 in 3. (10 per cent.)	10 to 30 m.
Ammoniæ Fortior	32·5 per cent.	Used externally.
Ammonii Acetatis	1 in 5.	2 to 6 drs.
Ammonii Acet. Fortior. ..	35 per cent.	25 to 75 m.
Ammonii Cit. Fortior	68 per cent.	½ to 1½ drs.
Ammonii Citratis	1 in 4.	2 to 6 drs.
Antimonii Chloridi	36 per cent.	Used externally.
Arsenicalis	1 in 100.	2 to 8 m.
Arsenici Hydrochloricus ..	1 in 100.	2 to 8 m.
Arsenii et Hydrg. Iod.	1 in 100.	10 to 30 m.
Atropinæ Sulphatis	1 in 100.	1 to 4 m.
Bismuthi et Ammon. Cit. ..	3 grs. in 1 dr.	½ to 1 dr.
Calcii Chloridi	1 in 6.	15 to 50 m.
Calcis	½ gr. in 1 oz.	1 to 4 oz.
Calcis Chlorinatæ	2 to 3 per cent. Cl.	10 to 20 m.
Calcis Saccharatus	7 grs. in 1 oz.	15 to 60 m.
Chlori	2·6 grs. in 1 oz.	10 to 20 m.
Epispasticus	1 in 4.	Used externally.
Ferri Acetatis	1 in 4.	5 to 30 m,
„ Acet. Fort.	40 per cent.	1 to 8 m.
„ Dialysatus	5 per cent.	10 to 30 m.
„ Perchloridi	1 in 4.	10 to 30 m.
„ „ Fortior ..	1 oz. iron in 5.	2 to 8 m.
„ Pernitratis	1 oz. iron in 30.	10 to 40 m.
„ Persulphatis	36 per cent.	—
Gutta percha	1 in 9.	Used externally.
Hydrargyri Nit. Acidus ..	48 per cent.	Used externally.
Hydrargyri Perchloridi ..	½ gr. in 1 oz.	½ to 2 drs.
Iodi	22 grs. in 1 oz.	5 to 10 m.
Lithiæ Effervescens	10 grs. in 1 pnt.	5 to 10 oz.
Magnesii Carbonatis	10 grs. in 1 oz.	1 to 2 oz.
Magnesii Citratis	3½ per cent.	5 to 10 oz.
Morphinæ Acetatis	1 in 100.	10 to 60 m.
Morphinæ Bimeconatis ..	1¼ in 100.	5 to 40 m.
Morphinæ Hydrochloratis	1 in 100.	10 to 60 m.
Plumbi. Subacetatis	24 per cent.	½ to 2 m.
„ Dilutus ..	1 in 80.	½ to 2 drs.
Potassæ	27 grs. in 1 oz.	15 to 60 m.
Potassæ Effervescens	30 grs. in 1 pnt.	5 to 10 oz.
Potassii Permanganatis ..	1 in 100.	2 to 4 drs.
Sodæ	18·8 grs. in 1 oz.	15 to 60 m.
Sodæ Chlorinatæ	2½ per cent. Cl.	10 to 20 m.
Sodæ Effervescens	30 grs. in 1 pnt.	5 to 10 oz.
Sodii Arseniatis	1 in 100.	5 to 10 m.
Sodii Ethylatis	19 per cent.	Used externally.
Strychninæ Hydrochloratis	1 in 100.	5 to 10 m.
Zinci Chloridi	46 grs. in 1 dr.	Used externally.

Lotiones (Lotions—2 in number) are liquid preparations for external application.

Lotio Hydrargyri Flava, 18 grs. hyd. perchlor. and 10 ozs. lime water.
Lotio Hydrargyri Nigra, 30 grs. calomel and 10 ozs. lime water.

Mella (Honeys—5 in number, including the oxymels), are preparations of honey. The two of any activity—Oxymel Scillæ and Mel Boracis—are inferior to the Syrup of Squill and Glycerine of Borax.

Mel.—A saccharine secretion from Apis Mellifica.
Mel Depuratum.—Honey melted and strained through flannel.
Mel Boracis.—60 grs. powdered borax mixed with 480 grs. honey, and 30 grs. glycerine.
Oxymel.—40 ozs. honey, 5 ozs. acetic acid, and 5 ozs. distilled water.
Oxymel Scillæ.—1 pint vinegar of squill and 2 lbs. honey.

Misturæ—Mixtures—10 in number).

MISTURA.	COMPOSITION.	STRENGTH PER OZ.
Ammoniaci ..	½ oz. ammoniacum rubbed up with 8 oz. water, and strained.	13½ grs.
Amygdalæ ..	2 oz. compound powder of almonds and 16 ozs. water, and strained.	54 grs.
Creasoti	15 minims each creasote and glacial acetic acid, 1 oz. syrup, ½ dr. spirit of juniper, and 15 oz. water.	1 minim.
Cretæ..	¼ oz. prepared chalk, ½ oz. gum acacia in powder, ½ oz. syrup, and 7½ oz. cinnamon water.	13½ grs.
Ferri Aromatica	1 oz. red bark, ½ oz. calumba root, ¼ oz. cloves, ½ oz. iron wire, 3 oz. compound tincture of cardamoms, ½ oz. tincture of orange peel, and peppermint water to 16 oz.	about $\frac{1}{20}$ gr.
Ferri Comp. ..	25 grs. sulphate of iron, 30 grs. carbonate of potassium, 60 grs. myrrh, 60 grs. sugar, 4 drs. spirit of nutmeg, 9½ oz. rose water.	2½ grs.
Guaiaci	½ oz. guaiacum resin, ½ oz. sugar, ¼ oz. gum acacia powdered, and 1 pt. cinnamon water.	11 grs.
Scammonii ..	6 grs. scammony in 2 oz. milk.	3 grs.
Sennæ Co. ..	4 oz. sulphate of magnesium, 1 oz. liq. extract of liquorice, 2½ oz. tincture of senna, 1½ ozs. compound tincture of cardamoms and infusion of senna 15 ozs.	1 dr. tinct. and 87 grs. mag. sulph.
Spt. Vini Gallici.	4 oz. brandy, 4 oz. cinnamon water, the yolks of 2 eggs, ½ oz. sugar.	3 drs.

The formula of each of the official mixtures may be regarded as a carefully written recipe in which a mixture is ordered, the ingredients being mostly in suspension. All are made with distilled waters. The dose may be said to be the same for all—from ½ to 1 or 2 oz.

Mucilagines (Mucilages—3 in number) should be, strictly speaking, watery solutions of a gum, but in mucilage of starch the starch is not dissolved. The following are in the Pharmacopœia :—

Mucilago Acaciæ.—4 oz. gum acacia dissolved in 6 oz distilled water.

Mucilago Amyli.—120 grs. starch boiled in 10 oz. distilled water.

Mucilago Tragacanthæ.—60 grs. of the powdered gum mixed with 2 drs. rectified spirit and 10 oz. distilled water added.

Oleata—(Oleates—2 in number) :—

Oleatum Hydrargyri.—1 oz. yellow oxide of mercury and 9 oz. oleic acid.

Oleatum Zinci.—1 oz. oxide of zinc and 9 oz. oleic acid.

Olea (Oils.)—Under this name there are 34 substances in the Pharmacopœia. They may be divided into two well-marked classes—fixed and volatile, the fixed being obtained by expression, and the volatile being products of distillation, except in the case of Ol. Limonis, a vegetable oil, which is volatile though obtained by expression. In addition to these, which are only known as oils, there are others equally deserving the name, as—camphor, which is a volatile oil; lard, wax, suet, and spermaceti, which are fixed.

Of the 34 oils, one is an animal product—cod liver oil—which is a fixed oil, and, omitting lemon, seven are expressed—Almond, Croton, Linseed, Nutmeg (concrete), Olive, Castor, and Theobroma. Two are semi-solid—viz., Theobroma and Concrete Oil of Nutmeg.

As a rule, they vary from colourlessness through straw and yellow to a pale brown, but cajuput is a deep green colour.

Cloves, cinnamon, pimento and mustard oils *sink* in water.

The dose of each of the volatile oils is, speaking generally, about 1 to 4 minims. The oil of mustard is a powerful poison, and should only be used externally. Of the fixed oils, croton is only given in doses of ⅓ to 1 minim, while of the remaining six nearly an ounce each may be given.

The volatile oils are added to the official pill masses for two reasons—to correct griping, and to serve as a means of distinguishing the various pill masses from each other by the odour.

Oleo-Resina.—There is one preparation of this class—Oleo-Resina Cubebæ—prepared by allowing an ethereal tincture of Cubebs to evaporate.

The following table gives the different oils, their source and preparation, and doses:—

OLEUM.	SOURCE AND HOW PREPARED.	DOSE.
Amygdalæ ..	Expressed from bitter or sweet almonds.	2 to 4 drs.
Anethi	Distilled in Britain from dill fruit.	1 to 4 mins.
Anisi	Distilled in Europe and China from the fruit of Anise and Star-anise.	1 to 4 mins.
Anthemidis ..	Distilled in Britain from the flowers.	1 to 4 mins.
Cajuputi	Distilled from the leaves.	1 to 4 mins.
Carui	Distilled in Britain from the fruit.	1 to 4 mins.
Caryophylli ..	Distilled in Britain from the flower buds.	1 to 4 mins.
Cinnamomi ..	Distilled from cinnamon bark.	1 to 4 mins.
Copaibæ	Distilled from the oleo-resin.	5 to 20 mins.
Coriandri ..	Distilled in Britain from the fruit.	1 to 4 mins.
Crotonis	Expressed in Britain from the seeds.	$\frac{1}{3}$ to 1 min.
Cubebæ	Distilled in Britain from the unripe fruit.	5 to 20 mins.
Eucalypti.. ..	Distilled from the fresh leaves.	1 to 4 mins.
Juniperi	Distilled in Britain from the unripe fruit.	1 to 4 mins.
Lavandulæ ..	Distilled in Britain from the flowers.	1 to 4 mins.
Limonis	Expressed from the fresh peel.	1 to 4 mins.
Lini	Expressed in Britain without heat from the seeds.	Used externally.
Menthæ Piperitæ	Distilled in Britain from the fresh flowering herb.	1 to 4 mins.
Menthæ Viridis	Distilled in Britain from the fresh flowering herb.	1 to 4 mins.
Morrhuæ	Extracted by a heat under 180° from the fresh liver.	1 to 8 drs.
Myristicæ ..	Distilled in Britain from the dried seeds.	1 to 4 mins.
Myristicæ Expressum ..	Expressed with aid of heat from do.	Not given.
Olivæ	Expressed from the ripe fruit.	$\frac{1}{2}$ to 1 oz.
Phosphoratum	Expressed oil of almonds and phosphorus, heated to 180°.	5 to 10 mins.
Pimentæ	Distilled in Britain from the unripe berry.	1 to 4 mins.
Pini Sylvestris	Distilled from the fresh leaves.	—
Ricini	Expressed from the seeds.	1 to 8 drs.
Rosmarini ..	Distilled from the flowering tops.	1 to 4 mins.
Rutæ	Distilled from the fresh herb.	1 to 4 mins.
Sabinæ	Distilled in Britain from fresh tops.	1 to 4 mins.
Santali	Distilled from the wood.	10 to 30 mins.
Sinapis	Distilled with water from the black seeds, after the removal of the fixed oil by expression.	Used externally.
Terebinthinæ..	Distilled from the oleo-resin.	10 mins. to 4 drs.
Theobromatis .	Expressed with heat from the ground seeds.	Not given.

Pilulæ (Pills—21 in number) are soft solid masses, capable of being easily made into little globular forms, intended to be swallowed whole. More than the half of them are purgative, and the dose is generally 5 to 10 grs. The dose of Pil. Phosphori is only 2 to 4 grs. The following table gives the name of each, its composition, and strength of the named ingredients :—

PILULA.	INGREDIENTS.	STRENGTH.
Aloes Barbadensis	Barbadoes aloes, hard soap, oil of caraway, and confection of roses.	1 in 2.
Aloes et Asafœt.	Socotrine aloes, asafœtida, hard soap, and confection of roses.	1 in 4.
Aloes et Ferri. ..	Sulphate of iron, Barbadoes aloes, compound powder of cinnamon, and confection of roses.	1 in 7.
Aloes et Myrrhæ	Socotrine aloes, myrrh, saffron, treacle and glycerine.	1 in 3.
Aloes Socotrinæ	Socotrine aloes, hard soap, volatile oil of nutmeg, and confection of roses.	1 in 2.
Asafœtidæ Co. ..	Asafœtida, galbanum, myrrh, and treacle.	1 in 3½.
Cambogiæ Co. ..	Gamboge, Barbadoes aloes, hard soap, compound powder of cinnamon, and syrup.	1 in 6.
Colocynth. Co. ..	Colocynth, Barbadoes aloes, scammony resin, sulphate of potassium, oil of cloves, and water.	1 in 6.
Colocynth. et Hyoscyami..	Compound colocynth pill and extract of hyoscyamus.	2 & 1, in 3.
Conii Co.	Extract of hemlock, ipecac., and treacle.	2½ in 3.
Ferri Carb.	Saccharated carbonate of iron and confection of roses.	1 in 1½.
Ferri Iodidi.. ..	Iron wire, iodine, sugar, powdered liquorice, and distilled water.	1 in 3½.
Hydrargyri ..	Mercury, confection of roses, and powdered liquorice.	1 in 3.
Hydrarg. Subchlor. Co. ..	Calomel, sulphurated antimony, guaiacum resin, and castor oil.	1 in 5.
Ipecacuanhæ C.	Dover's powder, squill, ammoniacum, and treacle.	1 in 23.
Scilla	Acetate of lead, opium, and confection of roses.	6 & 1, in 8.
Plumbi C. Opio ..	Phosphorus, balsam of tolu, yellow wax, and curd soap.	1 in 90.
Phosphori	Rhubarb, Socotrine aloes, myrrh, hard soap, oil of peppermint, treacle, and glycerine.	1 in 4½.
Rhei Co.	Opium, hard soap, and glycerine.	1 in 6. (of opium.)
Saponis Co.	Resins of scammony and jalap, curd soap, strong tincture of ginger, and rectified spirit.	1 in 3½.
Scammonii Co. ..	Squill, ginger, ammoniacum, hard soap, and treacle.	1 in 5.
Scillæ Co.		

The student of Pharmacy is expected to be able to distinguish each official pill mass by its physical qualities. As nearly all are dark brown or black in colour, only a few can be distinguished by sight—thus Pil. Hydrarg. is *blue;* Hyd. Subchlor. Co. a *bright orange;* and Conii *dark green.* The majority are distinguishable by smell—thus, Colocynth is known by its odour of cloves; Barbadoes aloes, by its caraway; Socotrine aloes by its nutmeg; Rufus pill, by its saffron; Aloes et Asafœtida, by its powerful fetid odour; whilst in Pil. Asafœtida Co., the myrrh almost conceals the stinking gum; Pil. Cambogiæ smells strongly of Barbadoes aloes, and is not of the yellow colour which the student might expect; Pil. Scillæ Co. is known by the odour of its ammoniacum; saponis, by its tawny colour and opium smell; rhubarb by its peppermint; and lead and opium, by the odour of acetic acid.

Pulveres (Powders) are 15 in number:—

PULVIS.	INGREDIENTS.	DOSE IN GRAINS.	STRENGTH.
Amygdalæ Co.	Sweet almonds, refined sugar, and acacia gum.	10 to 60.	8 in 13.
Antimonialis	Oxide of antimony and phosphate of calcium.	3 to 5.	1 in 3.
Catechu Co.	Catechu, kino, rhatany root, cinnamon, and nutmeg.	20 to 40.	1 in 2½.
Cinnamomi Co.	Cinnamon, cardamoms, and ginger.	3 to 10.	1 in 3.
Cretæ Aromaticus	Cinnamon, nutmeg, saffron, cloves, cardamoms, sugar, and chalk.	10 to 60.	1 in 4½.
Cretæ Aromat. C. Opio	Aromatic chalk powder, and opium.	10 to 40.	1 in 40. (opium.)
Elaterini Co.	Elaterin and sugar of milk.	½ to 5.	1 in 40.
Glycyrrhizæ Co.	Senna, liquorice root, sugar, fennel fruit and sulphur.	30 to 60.	1 in 6
Ipecacuanhæ Co.	Ipecacuanha, opium, and sulphate of potassium.	5 to 15.	1 in 10.
Jalapæ Co.	Jalap, cream of tartar, and ginger.	20 to 60.	1 in 3.
Kino Co.	Kino, opium, and cinnamon.	5 to 20.	1 in 20 (opium.)
Opii Co.	Opium, black pepper, ginger, caraway, and tragacanth.	2 to 5.	1 in 10.
Rhei Co.	Rhubarb, light magnesia, and ginger.	20 to 60.	1 in 4½.
Scammonii Co.	Scammony resin, jalap, and ginger.	10 to 20.	1 in 2.
Tragacanthæ Co.	Tragacanth, gum acacia, starch, and sugar.	20 to 60.	1 in 6.

The official powders are all called "compound" except three —Antimonial, Aromatic Chalk, and Aromatic Chalk with opium. They can be for the most part distinguished by their colour, which is given, with the exact weight of each constituent under the name of the drug, in the Materia Medica. The student cannot, however, depend upon colour *alone*, as cinnamon, aromatic chalk, aromatic chalk with opium, ipecacuanha, jalap, rhubarb, and scammony closely resemble each other, only differing by very faint gradations of colour. The smell, along with the colour, will distinguish most of them—thus, the odour of opium distinguishes the aromatic chalk and opium powder from the plain aromatic chalk.

Spiritus (Spirits—of which there are 18 in number) are for the most part alcoholic solutions of a volatile oil. The student should remember that all are colourless when freshly prepared except brandy.

SPIRITUS.	COMPOSITION.	STRENGTH.	DOSE.
Ætheris	Ether and spirit.	1 in 3.	½ to 1½ drs.
Ætheris Compositus (*Hoffmann's Anodyne.*)	Ethereal oil, ether, and spirit.	1 in 64.	½ to 2 drs.
Ætheris Nitrosi ..	A spirituous solution of nitrous compounds.	S. G. ·840–·845.	½ to 2 drs.
Ammoniæ Aromat.	Carbonate, strong solution of ammonia, v. oil of nutmeg, oil of lemon, spirit and water.	1 in 40. (Carbonate). 1 in 20. (Liq.Am.F.)	½ to 1 dr.
Ammoniæ Fœtidus ..	Asafœtida, strong solution of ammonia, and spirit.	1½ in 20.	½ to 1 dr.
Armoraciæ Compos.	Horseradish root, bitter orange peel, nutmeg, proof spirit, and water.	1 in 8.	1 to 2 drs.
Cajuputi	Oil of cajuput and spirit.	1 in 50.	½ to 1 dr.
Camphoræ	Camphor and spirit.	1 in 10.	10 to 30 m.
Chloroformi	Chloroform and spirit.	1 in 20.	20 to 60 m.
Cinnamomi	Oil of cinnamon and spirit.	1 in 50.	½ to 1 dr.
Juniperi	Oil of juniper and spirit.	1 in 50.	½ to 1 dr.
Lavandulæ	Oil of lavender and spirit.	1 in 50.	½ to 1 dr.
Menthæ Piperitæ ..	Oil of peppermint and spirit	1 in 50.	½ to 1 dr.
Myristicæ	Volatile oil of nutmeg and spirit.	1 in 50.	½ to 1 dr.
Rectificatus	Alcohol, with 16 per cent. of water.	56 O.P.	— —
Rosmarini	Oil of rosemary and spirit.	1 in 50.	½ to 1 dr.
Tenuior	Spirit 5 pints and water 3 pints.	49 p. cent.	—
Vini Gallici	Spirit distilled from French wine.	About do.	—

Succi (Juices—7 in number).—Two are introduced to make the syrups of the same name, viz.—**Succus Mori** and **Succus Limonis.** They are the juices of the fruits.

The remaining five, which are regarded as the juices proper of the British Pharmacopœia, are prepared by adding 1 measure of rectified spirit to 3 measures of the freshly expressed juice of the recently collected plants, setting the mixture aside to settle and afterwards filtering.

SUCCUS.	SOURCE.	DOSE.
Belladonnæ	Fresh leaves and young branches after flowering.	5 to 15 mins.
Conii	Fresh leaves and young branches when the fruit begins to form.	½ to 1 dr.
Hyoscyami	Fresh leaves, flowering tops and young branches.	½ to 1 dr.
Scoparii	Fresh tops.	1 to 2 drs.
Taraxaci	Fresh root gathered in autumn.	1 to 2 drs.

Suppositoria (Suppositories—8 in number), are small, solid masses, weighing about 15 grs. and of conical shape, containing some active ingredient blended with a fatty or soapy basis for introduction into the rectum. The following table shows the materials used and the strength of each :—

SUPPOSITORIA.	INGREDIENTS.	STRENGTH.
		GRS. IN EACH.
Acidi Carbolici cum Sapone	Carbolic acid, curd soap, and glycerine of starch.	1 gr.
Acidi Tannici	Tannic acid and oil of theobroma.	3 grs
Acidi Tannici cum Sapone	Tannic acid, glycerine of starch, curd soap, and starch.	3 grs.
Hydrargyri	Ointment of mercury and oil of theobroma.	5 grs. (ungt.)
Iodoformi	Iodoform and oil of theobroma.	3 grs.
Morphinæ	Hydrochlorate of morphine and oil of theobroma.	½ gr.
Morphinæ c. Sapone	Hydrochlorate of morphine, glycerine of starch, curd soap, and starch.	½ gr.
Plumbi Co.	Acetate of lead, opium, and oil of theobroma.	3 grs. and 1 gr. opium.

Syrupi (Syrups) 17 in number) are strong solutions of sugar, eaeh eharged with some preparation either to preserve it or make its administration more agreeable. 14 are of vegetable origin. They are mostly—the S.G. being generally about 1·33 —$\frac{1}{3}$ heavier than water, and loaf sugar only is used in their preparation, and the water that enters into their composition is to be distilled; the dose averages 1 dram.

The syrups are recognised by their eolour, with whieh the student should be familiar. Syrup, syrup of orange flowers, tolu, ehloral, iodide, and phosphate of iron are *colourless*.

Syrup of squill, lemon, orange peel, and ginger are straw-coloured; the last two being somewhat muddy.

Syrup of rhubarb, hemidesmus, and poppies are brown, whilst syrup of senna is a dark eoffee-brown.

Mulberry syrup is a rieh, deep, lake eolour, and hence its use to give an agreeable eolour to mixtures.

Syrups of red poppy, and red rose, are of brilliant shades of red.

The following table shows their composition and strength:—

SYRUPUS.	INGREDIENTS	STRENGTH (by volume.)
Syrupus	Sugar, 5 lbs.; water 2½ lbs.	1 in 1⅛.
Aurantii .. .	Syrup and tineture of orange peel.	1 in 8.
Aurantii Floris ..	Orange flower water, sugar, and water.	1 in 6¾.
Chloral	Hydrate of ehloral, syrup and water.	1 in 6.
Ferri Iodidi	Iron wire, iodine, sugar and water, eaeh dram contains 4·3 grains.	1 in 14.
Ferri Phosph. ..	Granulated sulphate of iron; biearbonate and phosphate of sodium, eoncentrated phosphorie aeid, sugar and water; 1 gr. in eaeh dram.	1 in 60.
Hemidesmi	Hemidesmus root, sugar and water.	1 in 8.
Limonis	Fresh lemon peel, juiee and sugar.	1 in 2.
Mori	Mulberry juice, sugar and reetified spirit.	1 in 2.
Papaveris	Seedless eapsules, reetified spirit, sugar and water.	1 in 2⅕.
Rhei	Rhubarb root, eoriander fruit, sugar, reetified spirit and water.	1 in 15.
Rhœados	Fresh red poppy petals, sugar, water and reetified spirit.	1 in 3½.
Rosæ Gallicæ ..	Dried red rose petals, sugar and water.	1 in 17.
Scillæ	Vinegar of squill and sugar	1 in 17. (of squill.)
Sennæ	Senna leaves, oil of coriander, sugar, water and rectified spirit.	1 in 2.
Tolutanus	Balsam of tolu, sugar and water.	1 in 29.
Zingiberis	Strong tineture of ginger and syrup.	1 in 26.

Tabellæ (Tablets—only one preparation is official).

Tabellæ Nitroglycerini—Tablets of chocolate each weighing $2\frac{1}{2}$ grs. and containing $\frac{1}{100}$ gr. pure nitroglycerine.

Tincturæ (Tinctures—72 in number) are alcoholic solutions, chiefly of vegetable substances, though two are from the animal kingdom—viz., cochineal and Spanish fly. Four are from the inorganic world—viz., perchloride of iron, acetate of iron, iodine, and chloroform, the remaining 66 being of vegetable origin. The most of the substances are ordered to be comminuted or powdered, macerated for 48 hours in $\frac{3}{4}$ of the spirit, then packed in a percolator, and when the fluid ceases to pass, the process is continued with the remaining $\frac{1}{4}$ of the spirit. The contents of the percolator are then subjected to pressure, the product filtered, mixed with the first liquid, and made up to the original bulk of the spirit employed.

42 tinctures are made in this mixed method of maceration and percolation.

19 are made by simple maceration, generally for seven days.

1 only (strong tincture of ginger) is made by pure percolation.

10 are made by simple solution or mixing.

In the majority, proof spirit (5 spirit and 3 of water) is used, but where an oily or resinous substance is to be operated upon, strong spirit is employed.

41 tinctures are made with proof spirit.

22 are made with rectified spirit.

4 with varying proportions of spirit and water.

2 are prepared with sal volatile (Guaiacum and Valerian).

1 with spirit of ether (Ethereal Tincture of Lobelia).

1 with tincture of orange peel (Tincture of Quinine).

1 mainly with syrup (Tincture of Chloroform and Morphine.)

$2\frac{1}{2}$ ozs. to the pint—that is, one part in 8, or $51\frac{1}{2}$ grs. in 1 oz., is the most common strength, since there are 37 tinctures so prepared.

55 tinctures consist of one ingredient and the solvent—"Tinctures Simple."

7 tinctures are called compound—"Tinctures Compound."

10 tinctures, though not *called* compound, contain more than one ingredient and the solvent—"Tinctures Complex."

TINCTURA.	INGREDIENTS IN 1 PINT.	STRENGTH.	DOSE.
Aconiti	2½ oz. root, rectified spirit.	1 in 8	5 to 15 m.
Arnicæ	1 oz. rhizome, rectified „	1 in 20	½ to 1 dr.
Asafœtidæ	2½ oz. gum, rectified „	1 in 8	½ to 1 dr.
Aurantii	2 oz. dried peel, proof „	1 in 10	1 to 2 drs.
Aurant. Rec.	6 oz. fresh peel, rectified „	1 in 3½	1 to 2 drs.
Belladonnæ	1 oz. leaves, proof „	1 in 20	5 to 20 mins.
Buchu	2½ oz. leaves, proof „	1 in 8	1 to 2 drs.
Calumbæ	2½ oz. root, proof „	1 in 8	½ to 2 drs.
Cannab. Ind.	1 oz. extract, rectified „	1 in 20	5 to 20 mins.
Cantharidis	¼ oz. flies, proof „	1 in 80	5 to 20 mins.
Capsici	¾ oz. fruit, rectified „	1 in 27	10 to 20 mins.
Cascarillæ	2½ oz. bark, proof „	1 in 8	½ to 2 drs.
Chiratæ	2½ oz. herb, proof „	1 in 8	½ to 2 drs.
Cimicifugæ	2½ ozs. rhizome, proof „	1 in 8	15 to 60 m.
Cinchonæ	4 oz. red bark, proof „	1 in 5	½ to 2 drs.
Cinnamomi	2½ oz. bark, rectified „	1 in 8	½ to 2 drs.
Cocci	2½ oz. insects, proof „	1 in 8	1 to 2 drs.
Colchici Sem.	2½ oz. seeds, proof „	1 in 8	10 to 30 mins.
Conii	2½ oz. fruit, proof „	1 in 8	20 to 60 mins.
Croci	1 oz. stigmas, proof „	1 in 20	¼ to 1 dr.
Cubebæ	2½ oz. fruit, rectified „	1 in 8	½ to 2 drs.
Digitalis	2½ oz. leaves, proof „	1 in 8	10 to 30 mins.
Ergotæ	5 oz. ergot, proof „	1 in 4	5 to 30 mins.
Ferri Perchlor.	5 oz. strong liquor, 10 water and 5 oz. rectified spirit	1 in 4	10 to 30 mins.
Gallæ	2½ oz. galls, proof „	1 in 8	½ to 2 drs.
Gelsemii	2½ oz. root, proof „	1 in 8	5 to 20 min.
Guaiaci Am.	4 oz. resin, sal volatile	1 in 5	½ to 1 dr.
Hyoscyami	2½ oz. leaves, proof spirit	1 in 8	½ to 1 dr.
Jaborandi	5 oz. leaves, proof „	1 in 4	½ to 1 dr.
Jalapæ	2½ oz. root, proof „	1 in 8	½ to 2 drs.
Krameriæ	2½ oz. root, proof „	1 in 8	½ to 2 drs.
Laricis	2½ oz. bark, rectified „	1 in 8	20 to 30 mins.
Limonis	2½ oz. fresh peel, proof „	1 in 8	½ to 2 drs.
Lobeliæ	2½ oz. herb, proof „	1 in 8	10 to 30 mins.
Lobeliæ Æth.	2½ oz. herb, spirit of ether.	1 in 8	10 to 30 mins.
Lupuli	2½ oz. strobiles, proof spirit	1 in 8	½ to 2 drs.
Myrrhæ	2½ oz. gum resin, rectified „	1 in 8	½ to 1 dr.
Nuc. Vomicæ	133 grs. extract, 4 oz. water. 16 oz. rectified spirit.	1 in 480 of Alkaloid.	10 to 20 m.
Opii	1½ oz. opium, proof „	1 in 13⅓	5 to 40 m.
Podophylli	160 grs. resin, rectified „	1 in 60	¼ to 1 dr.
Pyrethri	4 oz. root, rectified „	1 in 5	Not taken.
Quassiæ	¾ oz. chips, proof „	1 in 27	½ to 2 drs.
Quininæ	160 grs. hydroehlor, of quinine, tinct. of orange peel.	1 in 60	½ to 2 drs.
Sabinæ	2½ oz. tops, proof spirit	1 in 8	¼ to 1 dr.
Scillæ	2½ oz. bulb, proof „	1 in 8	10 to 30 m.
Senegæ	2½ oz. root, proof „	1 in 8	½ to 2 drs.
Serpentariæ	2½ oz. rhizome, proof „	1 in 8	½ to 2 drs.
Stramonii	2½ oz. seeds, proof „	1 in 8	10 to 30 m.
Sumbul	2½ oz. root, rectified „	1 in 8	10 to 30 m.
Tolutana	2½ oz. balsam, rectified „	1 in 8	20 to 40 m.
Valerianæ.	2½ oz. rhizome, proof „	1 in 8	1 to 2 drs.
Valerian.Am.	2½ oz. rhizome, sal volatile	1 in 8	½ to 1 dr.
Veratri Vir.	4 oz. rhizome, rectified spirit	1 in 5	5 to 20 m.
Zingiberis	2½ oz. rhizome, rectified „	1 in 8	¼ to 1 dr.
Zingib. Fort.	10 oz. rhizome, rectified „	1 in 2	5 to 20 m.

The student should remember the exceptions to the common strength in tinctures—thus in each pint—

Tinctura Camphoræ Composita	contains	30 grs. (camphor).
Tinctura Lavandulæ Composita	,,	45 min. (oil).
Tinctura Opii Ammoniata	,,	100 grs. (opium).
Tinctura Nucis Vomicæ	,,	133 grs. (extract).
Tinctura Podophylli	,,	160 grs. (resin).
Tinctura Cantharidis Tinctura Cardam. Co.	,,	¼ oz.
Tinctura Quininæ Tinctura Quininæ Amm.	,,	160 grs.
Tinctura Aloes Tinctura Iodi	,,	½ oz.
Tinctura Quassiæ Tinctura Capsici	,,	¾ oz.
Tinctura Arnicæ Tinctura Belladonnæ Tinctura Cannabis Ind. Tinctura Croci	,,	1 oz.
Tinctura Gentianæ Co. Tinctura Opii	,,	1½ oz.
Tinctura Aurantii Tinctura Benzoini Co. Tinctura Chloroformi Co. Tinctura Cinchonæ Co. Tinctura Kino Tinctura Rhei	,,	2 oz.
Tinctura Cinchonæ Tinctura Guaiaci Amm. Tinctura Pyrethri Tinctura Veratri Viridis	,,	4 oz.
Tinctura Ergotæ Tinctura Ferri Acetatis Tinctura Ferri Perchloridi Tinctura Jaborandi	,,	5 oz.
Tinctura Aurantii Recentis	,,	6 oz.
Tinctura Zingiberis Fortior	,,	10 oz.

The remaining thirty-seven tinctures contain 2½ oz. to the pint.

COMPLEX TINCTURES.

TINCTURA.	INGREDIENTS IN 1 PINT.	STRENGTH.	DOSE.
Aloes	½ oz. Socotrine aloes, 1½ oz. extract of liquorice, proof spt.	1 in 40.	1 to 2 drs.
Catechu	2½ oz. catechu, 1 oz. cinnamon, proof spt.	1 in 8.	½ to 2 drs.
Chloroformi et Morphinæ. (Chlorodyne.)	1 oz. chloroform, 2 drs. ether, 1 oz. spirit, 8 grs. hydrochlorate of morphine, ½ oz. prussic acid, 4 m. oil of peppermint, 1 oz. liq. ext. liquorice, 1 oz. treacle, syrup q.s. to 8 oz.	1 in 8. (chloroform). 1 gr. in 1 oz. (morphine).	5 to 10 m.
Ferri Acet. ..	5 oz. strong solution of acetate of iron, 1 oz. acetic acid, 5 oz. rectified spirit, 9 oz. distilled water.	1 in 4.	5 to 30 m.
Iodi	½ oz. iodine, ½ oz. iodide of potassium, rectified spt.	1 in 40.	5 to 20 m.
Kino	2 oz. gum kino, 3 oz. glycerine, 5 oz. water, 12 oz. rectified spt.	1 in 10.	½ to 2 drs.
Opii Ammon... (Scotch Paregoric.)	100 grs. of opium. 180 grs. each saffron and benzoic acid, 1 dr. oil of anise, 4 oz. strong solution of ammonia, rectified spirit.	1 in 96.	½ to 1 dr.
Rhei	2 oz. root, ¼ oz. each of coriander fruit and cardamoms and saffron, proof spirit.	1 in 10.	1 to 8 dr.
Sennæ	2½ oz. leaves, 2 oz. raisins, ½ oz. each of caraway and coriander, proof spirit.	1 in 8.	1 to 4 dr.
Quininæ Am. ..	160 grs. sulphate of quinine, 2½ oz. solution of ammonia, proof spirit.	1 in 60.	½ to 2 dr.

COMPOUND TINCTURES.

Benzoini Co. .. (Friar's Balsam.)	2 oz. benzoin, 1½ oz. storax, ½ oz. tolu, 160 grs. Socotrine aloes, rectified spirit.	1 in 10.	½ to 1 dr.
Camphoræ Co. (Paregoric.)	40 grs. opium, 40 grs benzoic acid, 30 grs. camphor, ½ dr. oil of anise, proof spt.	1 in 320. 1 in 240. (opium.)	¼ to 1 dr.
Cardamomi Co	¼ oz. seeds, ¼ oz. caraway, 2 oz. raisins, ½ oz. cinnamon, 55 grs. cochineal, proof spt.	1 in 80.	½ to 2 drs.
Chloroformi Co.	2 oz. chloroform, 10 oz. tincture of cardamoms (compound), rectified spirit.	1 in 10.	20 to 60 m.
Cinchonæ Co...	2 oz. *red* bark, 1 oz. orange peel, ½ oz. serpentary, 55 grs. saffron, 28 grs. cochineal, proof spirit.	1 in 10.	½ to 2 drs.
Gentianæ Co...	1½ oz. root, ¾ oz. orange peel, ½ oz. cardamoms, proof spirit.	1 in 13⅓.	½ to 2 drs.
Lavandulæ Co.	45 minims oil of lavender, 5 m. oil of rosemary, 75 grs. each cinnamon and nutmeg, 150 grs. red sandal wood, rectified spirit.	1 in 213.	½ to 2 drs.

Trochisci (Lozenges—12 in number) are small tablets, composed of sugar and gum, blended with a medicinal substance. All contain, in addition to the active substances giving them their name, the following :—Refined sugar, gum acacia, mucilage of acacia, and distilled water ; for the water in Troch. Bismuthi, *rose* water is used, and for the mucilage in Troch. Opii, extract of liquorice is used. The student can distinguish most of the lozenges by their colour, thus—Bismuth, chlorate of potassium, santonine, and soda are white ; morphine a dirty white, tannic acid is a light fawn, and ipecacuanha is buff, morphine and ipecacuanha is a cream colour, catechu a *light* brown, opium a *dark* brown, and iron is an iron-grey colour. The odour of roses distinguishes bismuth from soda and chlorate of potassium. The active ingredients can be easily recognised in each lozenge by the tongue. Each lozenge will weigh about 15 grs., except bismuth, which is much larger. The Pharmacopœia generally directs—"Mix the powders, and add the mucilage and water to form a proper mass ; divide into 720 lozenges, and dry these in a hot-air chamber with a moderate heat."

TROCHISCI.	INGREDIENTS.	GRAINS IN EACH.
Acidi Benzoici ..	Benzoic acid, sugar, gum, mucilage, and water.	$\frac{1}{2}$ gr.
Acidi Tannici ..	Tannin, tincture of tolu, sugar, gum, mucilage, and water.	$\frac{1}{2}$ gr.
Bismuthi	Subnitrate of bismuth, carbonate of magnesium, carbonate of calcium, sugar, gum, mucilage, and rose water.	2 grs.
Catechu	Catechu, sugar, gum, mucilage and water.	1 gr.
Ferri Redacti ..	Reduced iron, sugar, gum, mucilage and water.	1 gr.
Ipecacuanhæ.. ..	Ipecacuanha, sugar, gum, mucilage and water.	$\frac{1}{4}$ gr.
Morphinæ	Hydroch. of morphine, tincture of tolu, sugar, gum, mucilage & water.	$\frac{1}{360}$ gr.
Morphinæ & Ipecac	Do. with the addition of ipecacuan.	$\frac{1}{360}$ and $\frac{1}{720}$
Opii	Extract of opium, tincture of tolu, sugar, gum, extract of liquorice and water.	$\frac{1}{10}$ gr.
Potassii Chloratis	Chlorate of potassium, sugar, gum, mucilage and water.	5 grs.
Santonini..	Santonine, sugar, gum, mucilage and water.	1 gr
Sodii Bicarb.	Bicarbonate of sodium, sugar, gum, mucilage and water.	5 grs.

Unguenta (Ointments—43 in number) are mixtures of medicinal substances with lard, paraffin, or wax and oil, of the consistence of butter; for external application.

UNGUENTUM.	COMPOSITION.	STRENGTH.
Acidi Borici	Boric acid, soft and hard paraffin.	1 in 7.
Acidi Carbolici	Carbolic acid, soft and hard paraffin	1 in 19.
Acidi Salicylici	Salicylic acid, soft and hard paraffin.	1 in 28.
Aconitinæ	Aconitine, spirit, benzoated lard.	8 grs. to 1 oz
Antim. Tartar.	Tartar emetic and simple oint.	1 in 5.
Atropinæ	Atropine, spirit and benzoated lard	8 grs. to 1 oz
Belladonnæ	Alcoholic extract and benzoated lard.	50 grs. to 1 oz
Calaminæ	Prepared calamine and benzo. lard.	1 in 6.
Cantharidis	Cantharides, yellow wax, olive oil.	1 in 8.
Cetacei	Spermaceti, white wax, almond oil, and benzoin.	1 in 5.
Chrysarobini	Chrysarobin and benzoated lard.	1 in 25.
Creasoti	Creasote and simple ointment.	1 in 9.
Elemi	Elemi and simple ointment.	1 in 5.
Eucalypti	Oil of eucalyptus, soft and hard paraffin.	1 in 5.
Gallæ	Galls and benzoated lard.	80 grs. to 1 oz
Gallæ cum Opio	Ointment of galls and opium.	32 grs. to 1 oz
Glycerini Plumbi Subacetatis	Glycerine of subacetate of lead, soft and hard paraffin.	1 in 6.
Iodi	Iodine, iodide of potassium, glycerine and lard.	1 in 31.
Iodoformi	Iodoform and benzoated lard.	1 in 10.
Picis Liquidæ	Tar and yellow wax.	5 in 7.
Plumbi Acetatis	Acetate of lead and benzoated lard.	12 grs. to 1 oz
Plumbi Carbonatis	Carbonate of lead and simple oint.	1 in 8.
Plumbi Iodidi	Iodide of lead and simple oint.	1 in 8.
Potassæ Sulphuratæ	Sulphurated potash, hard and soft paraffin.	30 grs. to 1 oz
Potassii Iodidi	Iodide and carbonate of potassium, water, and benzoated lard.	1 in $8\frac{3}{4}$.
Resinæ	Resin, yellow wax, almond oil, and simple ointment.	1 in $3\frac{3}{4}$.
Sabinæ	Fresh savin tops, yellow wax and benzoated lard.	8 to 19.
Simplex	White wax, 2 oz.; benzoated lard, 3 oz.; and almond oil, 3 oz.	
Staphisagriæ	Stavesacre seeds and benz. lard.	1 in 3.
Sulphuris	Sublimed sulphur, benzoated lard.	1 in 5.
Sulphuris Iodidi	Iodide of sulphur, hard and soft paraffin.	30 grs. to 1 oz
Terebinthinæ	Oil of turpentine, resin, yellow wax and lard.	1 in 2.
Veratrinæ	Veratrine, olive oil, hard and soft paraffin.	1 in 63.
Zinci	Oxide of zinc and benzoated lard.	80 grs. to 1 oz
Zinci Oleati	Oleate of zinc and soft paraffin.	1 in 2.

Thirty ointments contain lard, either as prepared, or benzoated, or as simple ointment. Seven are mercurial; and in the preparation of iodide of potassium—distilled water is used.

About half of the ointments are a white, yellowish-white, or cream colour. Tar ointment and iodide of sulphur (when kept) are black; iodine, cantharides, galls, galls with opium, resin, and turpentine, are different shades of brown.

Savin, sulphurated potash, and belladonna, are greenish-brown; iodide of lead is a bright yellow; sulphur a primrose colour.

The seven ointments of mercury are of such importance as to demand a separate notice, and the student of Pharmacy will be expected to be familiar with their colours, which are more decidedly marked than those of the majority of ointments, thus—

Hydrargyri
Hydrargyri Co. } are blue or lead colour.

Hydrarg. Ammon.
Hydrarg. Subchlor. } are yellowish-white.

Hydrarg. Nitratis is a bright lemon.

Hydrarg. Nitratis Dil. is a pale yellow.

Hydrarg. Iod. Rub. is a brilliant scarlet.

Hydrarg. Oxid. Rub. is a brick red.

The following table gives their composition and strengths :—

OINTMENTS CONTAINING MERCURY.

UNGUENTUM.	COMPOSITION.	STRENGTH.
Hydrargyri	1 lb. mercury, 1 lb. lard, 1 oz. suet.	1 in 2.
Hydrg. Ammoniati	50 grs. ammoniated mercury, 450 grs. simple ointment.	1 in 10.
Hydrarg. Comp. ..	6 oz. mercurial ointment, 3 oz. olive oil, 3 oz. yellow wax, 1½ oz. camphor.	1 in 4½ (of Hg.)
Hydrg. Iodidi Rubri	16 grs. red iodide, 1 oz. simple ointment.	16 grs. to 1 oz
Hydrg. Nitratis ..	4 oz. mercury, 12 oz. nitric acid, 15 oz. lard, 32 oz. olive oil.	1 in 15½ (of Hg.)
Hydrg. Nitratis Dil.	1 oz. ointment of nitrate of mercury, soft paraffin 2 oz.	1 in 3.
Hydrg. Oxidi Rubri	62 grs. red precipitate, ¼ oz. hard paraffin, and ¾ oz. soft paraffin.	1 in 8.
Hydrg. Subchloridi	80 grs. calomel, 1 oz. benzoated lard	80 grs. to 1 oz

Vapores (Inhalations—6 in number) are preparations in which the vapour of some medicinal substance is taken into the air passages alone, or mixed with the vapour of water.

VAPOR.	INGREDIENTS.
Acidi Hydrocyanici	10 to 15 minims diluted hydrocyanic acid in 1 dr. cold water, and the vapour to be inhaled.
Chlori	2 oz. chlorinated lime, cold water q.s., do.
Coninæ	½ oz. juice of hemlock, 1 dr. solution of potash, 1 oz. water, the vapour of hot water is made to pass through 20 mins. of this.
Creasoti	12 minims creasote and 8 oz. boiling water, air to be passed through the solution and inhaled.
Iodi	1 dr. tincture of iodine, 1 oz. water, and apply heat before inhaling.
Olei Pini Sylvestris	40 mins. fir-wool oil, 20 grs. light carbonate of magnesium, water to 1 oz., 1 dram of this to be added to ½ pint boiling water and ½ pint cold water.

Vina (Wines—of which there are 11 in number) are simply tinctures made with sherry and orange wine instead of proof spirit.

VINUM.	COMPOSITION.	STRENGTH.	DOSE.
Aloes	Socotrine aloes, cardamoms, ginger and sherry.	¾ oz. to 1 pint.	1 to 2 drs.
Antimoniale	Tartar emetic and sherry.	2 grs. to 1 oz.	5 to 60 m.
Aurantii	(Used for citrate of iron and quinine wines.)	12 per cent (alcohol.)	——
Colchici	4 oz. dried corm and 1 pint sherry.	1 in 5.	10 to 30 m.
Ferri	1 oz. iron wire and 1 pint sherry.	Variable.	1 to 4 drs.
Ferri Citratis	Citrate of iron and ammonium, orange wine.	1 gr. in 1 dr.	1 to 4 drs.
Ipecacuanhæ	Ipecacuanha, acetic acid, distilled water, & sherry.	22 grs. to 1 oz.	½ to 6 drs.
Opii	Extract of opium, cinnamon, cloves, and sherry.	22 grs. to 1 oz.	10 to 40 m.
Quininæ	Sulphate of quinine, citric acid and orange wine.	1 gr. to 1 oz.	½ to 1 oz.
Rhei	Rhubarb root, canella bark and sherry.	33 grs. to 1 oz.	1 to 2 drs.
Xericum	(A Spanish wine.)	17 per cent (alcohol.)	——

Though the great majority of the preparations of the British Pharmacopœia are of a *compound nature*, still the words "Compositus," Composita, or Compositum, are not very often

appended. The confections, for instance, are of a very complex constitution, and they are not *called* compound preparations. The compound official preparations are—

2 Decoctions	viz.,	Aloes Co. Sarsæ Co.
1 Extract	,,	Colocynthidis Co.
2 Infusions	,,	Gentianæ Co. Aurantii Co.
2 Liniments	,,	Camphoræ Co. Sinapis Co.
2 Mixtures	,,	Ferri Co. Sennæ Co.
9 Pills	,,	Asafœtidæ Co. Cambogiæ Co. Colocynthidis Co. Conii Co. Hyd. Subchlor. Co. Rhei Co. Saponis Co. Scillæ Co. Scammonii Co.
12 Powders	,,	Amygdalæ Co. Catechu Co. Cinnamomi Co. Elaterini Co. Ipecacuanhæ Co. Jalapæ Co. Kino Co. Opii Co. Rhei Co. Scammonii Co. Tragacanthæ Co. Glycyrrhizæ Co.
2 Spirits	,,	Armoraciæ Co. Ætheris Co.
1 Suppository	,,	Plumbi Co.
7 Tinctures	,,	Benzoini Co. Camphoræ Co. Cardamomi Co. Chloroformi Co. Cinchonæ Co. Gentianæ Co. Lavandulæ Co.

2 Ointments—viz., { Hydrargyri Co. / Plumbi Subacetatis Co.

Extractum Colocynthidis Compositum is so called because the colocynth pulp ordered in it is first made into an extract with proof spirit, and the insoluble part rejected.

It resembles closely the compound pill of colocynth, both in its therapeutical effects and in its physical qualities. It is easily distinguishable, however, by the absence of the essential oil of cloves, which characterises the pill mass.

The powders are mostly called "Compound" to distinguish them from the powdered drug of the same name.

☞The student will note that all the articles and preparations included in the B.P., 1885, which were not in the late B.P., are marked in the following pages with an asterisk.

OFFICIAL REMEDIES.

ACACIÆ GUMMI (Gum Aeaeia)—Leguminosæ.

Gum Arabie; an exudation from the stem of Aeaeia Senegal, and other speeies of aeaeia, in spheroidal, eolourless tears, or in angular, glistening, eolourless or yellowish fragments.

Demuleent. Used chiefly to suspend insoluble powders in mixtures. (Page 297.)

Gum acacia enters into chalk and guaiacum mixtures, compound almond, and tragacanth powders, all the lozenges, and the following :—

Mucilago Acaciæ. 4 and 6.

An almost eolourless, translucent, viscid liquid; prepared by dissolving 4 oz. gum aeacia in 6 oz. cold distilled water.

Used in the preparation of all the lozenges in the Pharmacopœia, except opium—in which the powdered gum only is used.

Dose—1 to 4 drs.

Mucilage should not be ordered with tinctures or spirits unless freely dilnted with water; and in making a mixture of such ingredients the mucilage should be gradually added to the diluted spirituous liquid.

ACETUM (Vinegar).

A brownish, aeid liquid, prepared from malt and unmalted grain by the aeetous fermentation. Contains 5·4 per eent. of real aeetie aeid.

Refrigerant and diuretie.

Dose—1 dr. to 1 oz. (Page 297.)

It is used in making brown soap plaster.

Acetum Canthar. and Acetum Scillæ—(See under "Cantharis and Scilla.")

ACIDUM ACETICUM (Aeetie Aeid). $HC_2H_3O_2$.

A eolourless acid liquid, with a pungent odour, prepared from wood by destruetive distillation, and eontaining 33 per cent. of real aeetie acid.

Counter-irritant, Vesicant, and Caustic. (Page 298.)

The following preparations contain free acetic acid :—
Acetum; Acetum Cantharidis; Acetum Scillæ; Acid. Aceticum; Acid. Aceticum Dilutum; Acid. Aceticum Glaciale; Extract. Colchici Aceticum; Liniment. Terebinth. Acet.; Mistura Creasoti; Oxymel; Oxymel Scillæ; Syrupus Scillæ; Tinct. Ferri Acetatis; Liquor Morphinæ Acetatis.

Acidum Aceticum Dilutum. 1 in 8.

A colourless liquid, prepared by mixing acetic acid 1 pint, and distilled water 7 pints. Contains 4·27 per cent. of real acetic acid.

Dose and action same as "Acetum."

IN—Acetum Scillæ and Liquor Morphinæ Acetatis.

Acidum Aceticum Glaciale (Glacial Acetic Acid).

Concentrated acetic acid—a colourless fluid, crystallising when cooled, and containing nearly 99 per cent. of real acid.

Powerfully Caustic.

IN—Acetum Cantharidis, Mistura Creasoti, and Lin. Tereb. Acet.

The following are the percentages of real acetic acid found in

VINEGAR,	5·41	DILUTE ACETIC ACID,	4·27
ACETIC ACID,	33·0	GLACIAL ACETIC ACID,	98·8

ACIDUM ARSENIOSUM (Arsenious Acid). As_2O_3.

An anhydride (not a true acid), occurring as a heavy white powder or in sublimed vitreous masses, obtained by roasting arsenical ores. Known as Arsenic or White Arsenic. Soluble in 100 parts cold water.

Alterative and Tonic. Externally—Caustic. (Page 298.)

Dose—$\frac{1}{60}$ to $\frac{1}{12}$ of a grain in solution, after food.

Liquor Arsenicalis (Fowler's solution). 1 in 100.

A pinkish liquid, composed of arsenious acid in powder, and carbonate of potassium, of each 87 grains; compound tincture of lavender 5 drams, distilled water to 1 pint.

This is the most frequently used preparation of arsenic; and, like all the preparations of the drug, should be commenced in small doses and gradually increased. A good rule is to begin in adults with 2 minims and gradually increase to 8 or more—always after meals, and freely diluted. Children bear doses nearly as large as adults.

Liquor Arsenici Hydrochloricus. 1 in 100.

A colourless liquid, prepared by dissolving arsenious acid 87 grains in hydrochloric acid 2 drams, and distilled water to 1 pint.

Dose—2 to 8 minims, freely diluted.

***Arsenii Iodidum** (Iodide of Arsenium). AsI_3.

Small orange crystals obtained by direct combination of iodine and arsenium, or by evaporating a solution of arsenious and hydriodic acids.

Alterative and Tonic. (Page 300.)

Dose—$\frac{1}{30}$ grain.

*Liquor Arsenii et Hydrargyri Iodidi (Donovan's solution) 1 in 100.

A clear, pale yellow liquid, prepared by dissolving 45 grs. of iodide of arsenium and 45 grs. of red iodide of mercury in 10 oz. distilled water.

Alterative and Antisyphilitic.

Dose—10 to 30 minims, diluted, after meals.

Ferri Arsenias (Arseniates of iron with some oxide).

A tasteless, amorphous, greenish powder, insoluble in water, but readily dissolved in hydrochloric acid. Prepared by mixing solutions of arseniate and bicarbonate of sodium with one of sulphate of iron, filtering and drying at a low temperature.

Tonic and Alterative like Arsenic.

Dose—$\frac{1}{15}$ to $\frac{1}{2}$ a grain, in pill.

Sodii Arsenias. $Na_2H\,AsO_4.7H_2O$ and $Na_2HAsO_4,12H_2O$.

Colourless, transparent prisms, soluble in water; prepared by fusing together a mixture of arsenious acid, nitrate of sodium, and dried carbonate of sodium, dissolving the fused product in boiling water, and setting the solution aside to crystallise.

Dose—$\frac{1}{15}$ to $\frac{1}{8}$ grain, in pill or in mixture.

Liquor Sodii Arseniatis. 1 in 100.

A colourless solution of anhydrous arseniate of sodium, 4·5 grains in distilled water 1 oz.

Dose—5 to 10 minims, diluted, after food.

ACIDUM BENZOICUM (Benzoic Acid) $HC_7H_5O_2$.

A crystalline acid, obtained from benzoin by sublimation. In light feathery plates and needles, nearly colourless, and smelling like benzoin. It is not chemically pure.

Expectorant and Diuretic. (Page 300.)

Dose—10 to 15 grs.

IN—Ammonii Benzoas. Tr. Camph. Co. and Tr. Opii Ammon., and

*Trochisci Acidi Benzoici. $\frac{1}{2}$ gr. in each.

Composed of benzoic acid, sugar, gum acacia, mucilage of gum acacia, and distilled water.

Dose—1 to 5 lozenges.

*ACIDUM BORICUM (Boric, or Boracic Acid). H_3BO_3.

Colourless pearly lamellar crystals, obtained by the action of sulphuric acid on borax, or from native boric acid.

Antiseptic. (Pages 301 and 339.)

Dose—5 to 30 grs.

***Unguentum Acidi Borici.** 1 in 7.

A white or faintly yellow ointment, prepared by adding boric acid 1 part to a melted mixture of 2 parts of hard and 4 parts of soft paraffin.

Antiseptic.

ACIDUM CARBOLICUM (Carbolic Acid). HC_6H_5O.

An acid obtained by the fractional distillation of coal-tar. In colourless acicular crystals, or in faintly reddish crystalline masses, which become an oily liquid like creasote, at 91·5°.

Antiseptic and Escharotic. (Page 301.)

Dose—1 to 3 grs., in pill. Externally—Carbolic lotion, 1 part to 40 of water; carbolic oil 1 part to 10 or 20 of olive oil.

***Acidum Carbolicum Liquefactum.** 90 per cent.

A colourless or slightly reddish liquid, prepared by the addition of 10 per cent. of water to carbolic acid.

Dose—1 to 4 minims, largely diluted.

Glycerinum Acidi Carbolici. 1 *to* 4 (1 *in* 6 by weight).

A thick, colourless liquid, prepared by dissolving carbolic acid 1 oz. in glycerine 4 oz. One fluid dram contains 12 grs.

Dose—5 to 15 minims, freely diluted.

Suppositoria Acidi Carbolici Cum Sapone. 1 gr. in each.

Carbolic acid 12 grs., curd soap 180 grs., glycerine of starch 40 grs. Divided into 12 small conical masses.

Antiseptic and Local Anæsthetic.

***Unguentum Acidi Carbolici.** 1 in 19.

Carbolic acid 1, soft paraffin 12, and hard paraffin 6 parts.

Antiseptic and Deodorant.

***ACIDUM CHROMICUM** (Chromic Acid). CrO_3.

An anhydride in crimson acicular crystals, prepared by mixing a solution of bichromate of potassium with sulphuric acid, rejecting the crystals of acid sulphate of potassium which crystallise out, heating the liquor and adding more sulphuric acid when the anhydride crystallises out.

Caustic. (Page 303.)

***Liquor Acidi Chromici.** 1 in 4. or 29½ per cent. real acid.

An orange-red, inodorous, acid liquid, prepared by dissolving 1 oz. chromic acid in 3 oz. distilled water.

Caustic.

***ACID. CHRYSOPHANIC.** (See Chrysarobin.)

ACIDUM CITRICUM (Citric Acid). $H_3C_6H_5O_7,H_2O$.

An acid, in colourless rhombic crystals, obtained from the juice of the lemon or Citrus limetta (Aurantiaceæ) by boiling, adding chalk, and decomposing the resulting citrate of calcium by sulphuric acid.

Refrigerant.—Chiefly used as a substitute for lemon juice.

20 grs. dissolved in half an oz. of water are equivalent to one tablespoonful of fresh lemon juice, and will saturate in an effervescing mixture,

30 grs. bicarbonate of potassium in 1 oz. water.
24 grs. carbonate of potassium in 1 oz. water.
41 grs. carbonate of sodium in 1 oz. water.
24 grs. bicarbonate of sodium in 1 oz. water.
17 grs. carbonate of ammonium in 1 oz. water.

Dose—10 to 30 grs., in water. (Page 303.)

Succus Limonis, Syr. Limonis, and Vin. Quininæ contain free citric acid.

ACIDUM GALLICUM (Gallic Acid). $H_3C_7H_3O_5,H_2O$.

An acid in yellowish-white, satiny needles, prepared by boiling 1 part of galls with 4 of dilute H_2SO_4, straining whilst hot and purifying the acid which crystallises out, with animal charcoal. Soluble in 100 parts of cold water.

Astringent. Useful in internal hæmorrhages. (Page 304.)

Dose—2 to 10 grs. in solution, in pill or in powder.

Glycerinum Acidi Gallici. 1 *to* 4 (1 *in* 6 by weight).

A brownish, thick liquid, prepared by dissolving with heat 1 oz. of gallic acid in 4 fluid oz. of glycerine.

Astringent and Styptic.

Dose—20 to 60 minims, in a mixture.

Preparations containing gallic or tannic acids should not be combined with any preparation containing iron.

***ACIDUM HYDROBROMICUM DILUTUM.** 1 in 10.

A colourless aqueous solution, containing 10 per cent. of real hydrobromic acid, HBr., prepared by distilling a mixture of bromine and water, through which H_2S has been passed till the red colour is discharged. The distillate is diluted with water till the S.G. reaches 1·077.

Hypnotic and Sedative, like KBr. (Page 339.)

Dose—15 to 30 minims, diluted.

ACIDUM HYDROCHLORICUM (Hydrochloric Acid).

Hydrochloric acid (HCl) gas, dissolved in water, and forming 32 per cent. of the solution, which is nearly colourless and strongly acid, emitting white vapours, with a pungent odour. It is obtained by distilling a mixture of common salt, sulphuric acid, and water; known also as muriatic acid.

Internally—A mild Tonic Astringent. Externally—Caustic.

Dose—2 to 8 minims, but always given as acid. hydrochloricum dilutum. (Page 305.)

In—Acid. Nitro-Hydrochlor, Dil.; Liq. Antim. Chloridi.; Liq. Arsenici Hydrochlor., and the following:—

Acidum Hydrochloricum Dilutum. 1 in 3·3. (10·5 per cent. real acid.)

A colourless mixture of hydrochloric acid and distilled water.

Dose—10 to 30 minims, in water.

In—Liq. Morph. Hydrochlor. and Liq. Strychninæ Hydrochlor.

ACIDUM HYDROCYANICUM DILUTUM. 1 in 50. (Dilute Hydrocyanic Acid.) HCN.

Prussic Acid, dissolved in water, and forming 2 per cent. of the solution; prepared by acting on ferrocyanide of potassium with sulphuric acid, and distilling the mixture. It is a colourless liquid, with a strong odour of peach blossoms.

Sedative—a most deadly poison. (Page 307.)

Dose—2 to 8 minims, in water.

Scheele's Prussic Acid is 2½ times stronger than the above.

In—Tinctura Chloroformi et Morphinæ and

Vapor Acidi Hydrocyanici.

Diluted hydrocyanic acid, 10 to 15 minims; cold water 1 dr. —mixed in a suitable apparatus, and the vapour inhaled.

***ACIDUM LACTICUM** (Lactic Acid). $HC_3H_5O_3$.

A colourless syrupy liquid, consisting of lactic acid and 25 per cent. of water, prepared by the action of a peculiar ferment on solution of sugar.

A solvent of false membranes. (Page 308.)

***Acidum Lacticum Dilutum.** 3 in 20.

A colourless liquid, consisting of lactic acid, 3 oz., and distilled water q.s. to 1 pint.

Tonic, Refrigerant, and Discutient.

Dose—½ to 2 drams, freely diluted.

***ACIDUM MECONICUM** (Meconic Acid). $H_3C_7HO_7$.

An acid in micaceous crystals, obtained from opium, and possessing feeble physiological action. It is only used in making Liquor Morphinæ Bimeconatis.

ACIDUM NITRICUM (Nitric Acid). HNO_3

An acid prepared from nitrate of potassium, or nitrate of sodium, by distillation with sulphuric acid and water, and containing 70 per cent. by weight of HNO_3. A colourless, heavy liquid, emitting an acrid, corrosive vapour.

Corrosive—Not used internally in this form. (Page 305.)

In—Liq. Ferri Pernit., Liq. Hydrarg. Nit. Acidus, Ungt. Hyd. Nit., and the following :—

Acidum Nitricum Dilutum. 1 in $5\frac{1}{6}$.

A colourless mixture of nitric acid 6 oz. and distilled water 25 oz.—corresponding to 17·44 per cent. real acid.

Tonic and mildly Astringent.

Dose—10 to 30 minims, freely diluted.

Acidum Nitro-Hydrochloricum Dilutum. $\frac{3}{4}$ and 1 in 8.

Nitric acid, 3 oz.; hydrochloric acid, 4 oz.; distilled water, 25 oz., making a colourless liquid.

Dose—5 to 20 minims, freely diluted. (Page 308.)

***ACIDUM OLEICUM** (Oleic Acid). $HC_{18}H_{33}O_2$.

A straw-coloured liquid, nearly odourless and tasteless, obtained by the saponification of olein, or by the action of superheated steam on fats, with subsequent purification by pressure.

Only used in making Oleatum Hydrarg., Oleatum Zinci, and Ungt. Zinci Oleati.

***ACIDUM PHOSPHORICUM CONCENTRATUM** (Concentrated Phosphoric Acid). H_3PO_4.

A colourless syrupy liquid, consisting of phosphoric acid with 33·7 per cent. of water, obtained by distilling a mixture of 413 grs. phosphorus, 6 fl. oz. of nitric acid, and q.s. distilled water, and afterwards evaporating the distillate to 3 fl. oz.

Externally Caustic. Internally Tonic. (Page 310.)

Dose—2 to 5 minims, freely diluted.

In—Syrupus Ferri Phosphatis and

Acidum Phosphoricum Dilutum. 3 in 20.

A colourless liquid, prepared by mixing 3 oz. concentrated phosphoric acid with q.s. distilled water to measure 1 pint.

Tonic and Refrigerant.

Dose—5 to 30 minims, freely diluted.

***ACIDUM SALICYLICUM** (Salicylic Acid. $HC_7H_5O_3$.

An acid in white acicular crystals, obtained by the combination of the elements of carbolic acid with those of carbonic acid gas, and subsequent purification ; or from natural salicylates, as oils of wintergreen (gaultheria procumbens) and birch.

Antipyretic and Antirheumatic. (Page 310.)

Dose—5 to 30 grs., suspended in water.

***Unguentum Acidi Salicylici.** 1 in 28.

A yellowish or white ointment, prepared by melting together 1 part of salicylic acid, 9 parts of hard, and 18 parts of soft paraffin.

***Sodii Salicylas.** $(NaC_7H_5O_3)_2,H_2O$.

Small colourless crystalline scales, obtained by the action of salicylic acid on carbonate of sodium or on caustic soda.

Antipyretic and Antirheumatic.

Dose—10 to 30 grs. in water.

Salicylic Acid or its Sodium Salt should not be prescribed with Quinine in a mixture.

ACIDUM SULPHURICUM (Sulphuric Acid). H_2SO_4.

A heavy, colourless liquid, of oily consistence, formed by burning sulphur, and acting on the resulting sulphurous acid by means of nitrous and aqueous vapours. It contains 98 per cent. of H_2SO_4.

A powerful Corrosive. (Page 312.)

Acidum Sulphuricum Aromaticum. 1 in 14.

An aromatic liquid, prepared by mixing 3 oz. sulphuric acid gradually with 36 oz. spirit, and adding 2 oz. spirit of cinnamon, and 2 oz. strong tincture of ginger. Commonly called "elixir of vitriol."

Tonic and Astringent.

Dose—5 to 30 minims, freely diluted.

IN—Infusum Cinchonæ Acidum.

Acidum Sulphuricum Dilutum. 1 in 12 nearly.

A colourless mixture, of sulphuric acid 7 oz. and distilled water q. s. to measure 83½ oz.

Tonic and Astringent.

Dose—5 to 30 minims, freely diluted.

IN—Infusum Rosæ Acidum.

ACIDUM SULPHUROSUM (Sulphurous Acid). H_2SO_3.

Sulphurous acid gas (SO_2) dissolved in water, forming a colourless liquid, with a pungent sulphurous odour, and constituting 5 per cent. of the solution. Prepared by deoxidising sulphuric acid with wood charcoal in the presence of heat.

Antiseptic. Externally—Antiparasitic. (Page 312.)

Dose—½ to 1 dram, freely diluted.

ACIDUM TANNICUM (Tannic Acid). $C_{27}H_{22}O_{17}$.

An acid in pale yellow masses or thin glistening scales, prepared by exposing powdered galls to a damp atmosphere for

three days, adding enough ether to form a paste, pressing the mixture, and evaporating the liquid squeezed out.

Powerfully Astringent. Readily soluble in water. (Page 304.)

Dose—2 to 10 grs. in pill, powder, or solution.

Glycerinum Acidi Tannici. 1 *to* 4. (1 *in* 6 by weight.)

Tannic acid, 1 oz.; glycerine, 4 oz.; dissolved by gentle heat, making a greenish-brown viscid liquid, chiefly used for its local astringent action.

Suppositoria Acidi Tannici. 3 grs. in each.

Tannic acid 3 grs., and oil of theobroma 12 grs.

Local Astringent and Styptic.

Suppositoria Acidi Tannici Cum Sapone. 3 grs. and $8\frac{1}{2}$ grs.

Consisting of tannic acid, glycerine of starch, curd soap, and starch. Action like the above.

Trochisci Acidi Tannici. $\frac{1}{2}$ gr. in each.

Composed of tannic acid, tincture of tolu, sugar, gum acacia, mucilage of gum acacia, and distilled water.

Dose—1 to 6 lozenges.

ACIDUM TARTARICUM (Tartaric Acid). $H_2C_4H_4O_6$.

An acid, in colourless crystals, prepared from the acid tartrate of potassium or cream of tartar, by neutralising a strong solution with chalk, adding chloride of calcium, and treating the tartrate of lime thus formed with diluted sulphuric acid, evaporating and purifying the crystals.

Refrigerant. Chiefly used in effervescing mixtures.

Dose—10 to 30 grains in water. (Page 312.)

ACONITI FOLIA (Aconite Leaves)—Ranunculaceæ.

The smooth, palmate, deeply-divided fresh leaves and flowering tops of Aconitum napellus (Monkshood), grown in Britain.

Extractum Aconiti.

The juice expressed from the fresh leaves and tops is heated gradually to 130°, and the green colouring matter separated by a calico filter. The strained liquor is heated to 200° to coagulate the albumen (the presence of which favours decomposition), and again filtered. The filtered liquor is evaporated by a water-bath to the consistence of a syrup, the green colouring matter added, and the evaporation continued under 140° till the pilular consistence is reached.

Sedative and Cardiac Depressant. (Page 312.)

Dose—$\frac{1}{4}$ to 1 gr., in pill.

ACONITI RADIX (Aconite Root)—Ranunculaceæ.

The dried root of Aconitum napellus, from Great Britain or Germany. A brownish-black tapering root, with fleshy fibres arising from it, collected in winter or early spring.

Cardiac Sedative.

Tinctura Aconiti. 2½ oz. to 1 pint. (54½ grs. in 1 oz.)

A pale sherry-colonred liquid, prepared by macerating and percolating aconite root in No. 40 powder 2½ oz., with rectified spirit 1 pint.

Dose—5 to 15 minims.

Linimentum Aconiti. 1 in 1½.

Aconite root, 20 oz.; camphor, 1 oz.; rectified spirit to 30 oz.

A powerful Sedative and Anodyne. For external use only.

Aconitina (Aconitine).

A white amorphous alkaloid, obtained from aconite root. Aconite root is boiled and percolated with spirit, the spirit is evaporated, the watery solution of the residue, treated with ammonia gives the alkaloid, which is afterwards purified by ether and water acidulated with sulphuric acid.

A powerful Poison. Should not be given internally.

Unguentum Aconitinæ. 8 grs. to 1 oz.

A white ointment, composed of aconitine, 8 grs.; rectified spirit, ½ dram; benzoated lard, 1 oz.

Similar in action to the liniment.

ADEPS BENZOATUS (Benzoated Lard). 1 to 50.

Made by heating 1 lb. of prepared lard and 140 grs. of benzoin for two hours, and straining.

Emollient. Less liable to decompose than Adeps Præparatus.

Enters into the composition of about ⅓ of the ointments.

Unguentum Simplex (Simple ointment).

An emollient white ointment composed of white wax 2 oz., benzoated lard 3 oz., and almond oil 3 oz., melted and stirred till cold.

It enters into eight ointments.

ADEPS PRÆPARATUS (Prepared Lard).

The internal soft white fat from the abdomen of the pig, purified by melting and straining.

It enters into the preparation of 30 ointments (either as lard, benzoated lard, or simple ointment), and into Emplastrum Cantharidis.

ÆTHER (Ether). (Or Sulphuric ether). $C_4H_{10}O$. or $(C_2H_5)_2O$.

A colourless, volatile, inflammable liquid, with a strong odour, containing not less than 92 per cent. by vol. of pure ether, prepared from alcohol by the action of sulphuric acid, and subsequently purified by slaked lime and chloride of calcium.

A general diffusible Stimulant and Narcotic. (Page 313.)

Dose—20 to 60 minims, in syrup or water.

IN—Collodium, Collodium Flexile, Tinct. Lobeliæ Ætherea, and Tinct. Chloroformi et Morphinæ and the following :—

Æther Purus. $C_4H_{10}O$.

Ether freed from alcohol and water by the action of chloride of calcium, lime, and redistillation.

Used externally as a local Anæsthetic.

Spiritus Ætheris. 1 in 3.

Ether 10 oz., rectified spirit 20 oz. (mixed)—making a colourless liquid.

Dose—30 to 90 minims.

IN—Tinctura Lobeliæ Ætherea.

***Spiritus Ætheris Compositus** (Hoffmann's Anodyne). 1 in 3 nearly.

A colourless liquid, consisting of 3 drs. of heavy oil of wine (prepared by the action of sulphuric acid on rectified spirit), 8 oz. of ether, and 16 oz. rectified spirit.

Stimulant and Anodyne.

Dose—$\frac{1}{2}$ to 2 drams, diluted.

Spiritus Ætheris Nitrosi (Spirit of Nitrous Ether).

A transparent and almost colourless "spirituous solution containing nitrous compounds, aldehyd, and other substances," obtained by cautiously heating together 3 oz. nitric acid, 2 oz. sulphuric acid, 2 oz. copper wire, and 1 pint rectified spirit in a retort, and afterwards adding 2 pints rectified spirit to the 14 oz. of distillate.

Diaphoretic, Diuretic, and Antispasmodic. (Page 314.)

Dose—$\frac{1}{2}$ to 2 drs.; 8 minims for a child 1 year old.

ÆTHER ACETICUS (Acetic Ether). $C_2H_5C_2H_3O_2$.

A colourless liquid, with an agreeable odour, prepared by distilling acetate of sodium, rectified spirit, and sulphuric acid, and purifying by the action of carbonate of potassium.

Stimulant and Antispasmodic. (Page 314.)

Dose—20 to 60 minims.

IN—Liquor Epispasticus.

ALCOHOL AMYLICUM (Fousel Oil). $C_5H_{11}HO$.

A colourless, oily liquid, with an offensive odour, obtained in the distillation of the crude spirit produced by the action of yeast on saccharine solutions, purified by redistillation; only the product passing over at 253° to 260° should be collected.

Only used in the preparation of Amyl Nitris and Sodii Valerianas.

***ALCOHOL ETHYLICUM** (Ethylic Alcohol). C_2H_5HO.

A colourless liquid, containing not more than 1 or at most 2 per cent. of water, prepared by extracting the water from rectified spirit, by macerating it with anhydrous carbonate of potassium and recently dried chloride of calcium, and distilling. Known as Absolute Alcohol.

Used in the preparation of Chloroform and Liq. Sodii Ethylatis.

ALOE BARBADENSIS (Barbadoes Aloes)—Liliaceæ.

The thickened juice which flows from the transversely cut base of the leaf of Aloe Vulgaris, from Barbadoes and Curaçoa, in dark brown masses, the smallest films of which are translucent and orange-brown in tint, with a disagreeable odour like the axilla. The powder is a dull greenish yellow.

ALOE SOCOTRINA (Socotrine Aloes)—Liliaceæ.

The thickened juice which flows from the transversely cut base of the leaf of Aloe Perryi, and probably other species from Socotra and Zanzibar, in *golden* or reddish brown masses, the small fragments of which are translucent at the edges, with an *agreeable* aromatic odour. The powder is a bright yellow or orange brown colour.

Cathartic—Both varieties are similar in action. (Page 317.)

Dose—2 to 6 grs. in pill.

***ALOIN** (Aloin). $C_{16}H_{18}O_7$.

Yellow, inodorous tufts of acicular crystals, extracted from different varieties of aloes by solvents, and purified by recrystallisation.

Cathartic.

Dose—$\frac{1}{2}$ to 2 grs. in pill.

In addition to the preparations bearing the name Aloes, all of which are given below, the drug enters into the following :—

Pil. Cambogiæ Co., 1 in 6.
Pil. Colocynth Co., 1 in 3.
Pil. Colocy. *et* Hyoscy., 1 in $4\frac{1}{2}$.
Pil. Rhei Co., 1 in 6.
Extract. Colocynth. Co., 1 in $2\frac{1}{4}$.
Tinct. Benzoini Co., 1 in 60.

Decoctum Aloes Compositum. 4 grs. (Ext.) in 1 oz.

A rich, dark-brown liquid, prepared by boiling together for five minutes extract of Socotrine aloes, ½ oz.; myrrh, saffron, and carbonate of potassium, of each ¼ oz.; extract of liquorice 2 oz.; compound tincture of cardamoms, 15 oz.; distilled water to 50 oz. The tincture should be added after cooling.

Dose—½ to 2 oz.

Enema Aloes. 4 grs. in 1 oz.

Aloes, 40 grs.; carbonate of potassium, 15 grs.; mucilage of starch, 10 oz.—mixed and rubbed together.

Extractum Aloes Barbadensis. 4 parts from 5.

A *solid* extract, obtained by dissolving Barbadoes aloes in boiling water, and evaporating the solution.

Dose—2 to 6 grs. in pill. It is less liable to gripe than the powdered aloes.

Extractum Aloes Socotrinæ. 1 part from 2.

Preparation and dose same as the preceding.

Enters into Dec. Aloes Co. and Extract. Colocynth. Co.

Pilula Aloes Barbadensis. 1 in 2.

Barbadoes aloes (in powder), 2 oz.; hard soap (in powder), 1 oz.; oil of caraway, 1 dram ; confection of roses, 1 oz.

Dose—5 to 10 grs.

Pilula Aloes Socotrinæ. 1 in 2.

Socotrine Aloes (in powder), 2 oz.; hard soap (in powder), 1 oz.; volatile oil of nutmeg, 1 dram ; confection of roses, 1 oz.

Dose—5 to 10 grs.

Pilula Aloes et Asafœtidæ. 1 in 4.

Socotrine aloes, asafœtida, hard soap, and confection of roses, of each 1 oz.

Dose—5 to 10 grs.

Cathartic and Antispasmodic.

Pilula Aloes et Ferri. 1 in 5¼.

Sulphate of iron, 1½ oz.; Barbadoes aloes, 2 oz.; compound powder of cinnamon, 3 oz.; confection of roses, 4 oz.

Cathartic and Emmenagogue.

Dose—5 to 10 grs.

Pilula Aloes et Myrrhæ (Rufus' Pill.) 1 in 2½ nearly.

Socotrine aloes, 2 oz.; myrrh, 1 oz,; saffron (dried), ½ oz.; treacle, 1 oz.; glycerine, q.s.

Cathartie and Emmenagogue.
Dose—5 to 10 grs.

Tinctura Aloes. 11 grs. in 1 oz.

A dark brown liquid, prepared by maeerating Soeotrine aloes ½ oz., extraet of liquoriee 1½ oz., in proof spirit 1 pint.
Dose—1 to 2 drams.

Vinum Aloes. 16½ grs. in 1 oz.

A dark brown liquid, prepared by maeerating Soeotrine aloes 1½ oz., eardamoms and ginger of eaeh 80 grs., in sherry 10 oz.
Dose—1 to 2 drams.

ALUMEN (Alum). $Al_2 3SO_4, K_2SO_4, 24H_2O$.
Or $Al_2 3SO_4, (NH_4)_2SO_4, 24H_2O$.

A sulphate of aluminium and potassium (potash alum), or of aluminium and ammonium (ammonia alum), erystallised from aqueous solution, in eolourless transparent erystalline masses. Crystals soluble in 10 or 11 parts of water.
Astringent. In large doses emetie. (Page 318.)
Dose—10 to 20 grs.

Alumen Exsiccatum (Dried Alum). $Al_2 3SO_4, K_2SO_4$.

Prepared by heating potassium alum until it loses 45½ per eent. of its weight, and redueing the residue to powder.
Externally—Styptie.

***Glycerinum Aluminis.** 1 *to* 5 (1 *in* 7¼ by weight).

A thiek syrupy liquid prepared by heating 1 oz. alum with 5 oz. glyeerine, and pouring off the elear liquid from any deposit after settling.
Loeal Astringent.

AMMONIACUM (Ammoniacum)—Umbelliferæ.

A gum-resinous exudation, from the stem (after being punetured by beetles) of Dorema Ammoniaeum, in pale brown tears or masses, breaking with a smooth, *white* fraeture.
A Stimulating Expeetorant. (Page 319.)
Dose—10 to 20 grs. in an emulsion.

Emplastrum Ammoniaci Cum Hydrargyro. 12 in 15.

Ammoniaeum, 12 oz.; mereury, 3 oz.; olive oil, 56 grs.; sulphur, 8 grs.; mixed with the aid of heat.
Resolvent to enlarged glands.

Mistura Ammoniaci. 13½ grs in 1 oz.

Ammoniacum ¼ oz., rubbed with 8 oz. distilled water to form a white emulsion, like dirty milk.

Dose—½ to 1 oz.

Ammoniacum also enters into the composition of Empl. Galbani, Pil. Scillæ Co. and Pil. Ipecac. cum Scilla.

AMMONII BENZOAS (Benzoate of Ammonium).

$NH_4C_7H_5O_2$.

Colourless lamiuar crystals, prepared by acting on ammonia solution with benzoic acid and evaporating.

Diuretic. (Page 321.)

Dose—10 to 20 grs. in water.

Ammonii Bromidum. NH_4Br.

In colourless crystals, which may become slightly yellow by exposure to the air, and are very soluble in water, formed by neutralising hydrobromic acid with ammonia, evaporating and crystallising.

Laryngeal Sedative. Useful in Whooping Cough.

Dose—2 to 20 grains. For a child 1 year old, 2 grains.

Ammonii Carbonas. $N_3H_{11}C_2O_5$.

A volatile salt, in translucent crystalline masses, with strong ammoniacal odour, prepared by subliming a mixture of sulphate of ammonium, or chloride of ammonium and carbonate of calcium.

A Diffusible Stimulant, Expectorant and Emetic.

Dose—3 to 10 grs.; 17 grs. neutralise ½ oz. lemon juice.

IN—Liq. Ammon. Acet. Fort., Spt. Ammon. Aromat.

Ammonii Chloridum. NH_4Cl. (Sal Ammoniac.)

In colourless, inodorous, translucent, fibrous masses; tough, and difficult to powder; very soluble in water; prepared by neutralising hydrochloric acid with ammonia, and evaporating.

Expectorant and Ciliary Excitant. (Page 321.)

Dose—5 to 20 grains. Pieces may be sucked like a lozenge.

IN—Liq. Hydrarg. Perchlor. and Liq. Ammoniæ Fortior.

Ammonii Nitras. NH_4NO_3.

A white deliquescent salt, produced by neutralising dilute nitric acid with solution or carbonate of ammonium, evaporating and drying the crystals under a heat of 320°.

Only used for making nitrous oxide.

Ammonii Phosphas. $(NH_4)_2HPO_4$.

In transparent colourless prisms, which have crystallised out of a concentrated solution of ammonia, which has been neutralised by dilute phosphoric acid.

Diuretic. (Page 323.)

Dose—5 to 20 grains, in water.

Linimentum Ammoniæ. 1 in 4.

An emulsion known as "hartshorn and oil," composed of—Solution of ammonia, 1 oz.; olive oil, 3 oz.

Rubefacient.

Liquor Ammoniæ Fortior. NH_3. 15·8 grs. NH_3 in 1 dr.

Ammoniacal gas, dissolved in water, and constituting 32·5 per cent. of the solution, prepared by distilling a mixture of chloride of ammonium, slaked lime, and water.

Vesicant. Should not be used internally.

IN—Linimeut. Camph. Co., Liquor Ammoniæ, Liquor Ammonii Citratis Fort., Spiritus Ammoniæ Aromaticus, Tinctura Opii Am., Ammonii Phosphas and Spt. Am. Fœtid.

Liquor Ammoniæ. NH_3. 1 in 3. 5·2 grs. NH_3 in 1 dr.

Ammoniacal gas, dissolved in water, and constituting 10 per cent. of the liquid, prepared by mixing one pint of strong solution of ammonia with two pints of distilled water.

Stimulant and Rubefacient.

Dose—5 to 15 minims, freely diluted.

IN—Linim. Ammoniæ and Tr. Quininæ Ammon.

***Liquor Ammonii Acetatis Fortior.** $NH_4C_2H_3O_2$.

A colourless liquid, prepared by neutralising 17½ oz. carbonate of ammonium with 50 oz. acetic acid, and adding water to 60 oz. Contains 35 per cent. $NH_4C_2H_3O_2$.

Diuretic and Diaphoretic.

Dose—25 to 75 minims.

Liquor Ammonii Acetatis. 1 in 5.

A colourless liquid, prepared by mixing 1 oz. of the above strong solution of acetate of ammonium with 4 oz. distilled water.

Diaphoretic. Known as Mindererus Spirit.

Dose—2 to 6 drams. In acute alcoholism, 2 oz.

***Liquor Ammonii Citratis Fortior.** $(NH_4)_3C_6H_5O_7$.

A colourless liquid, prepared by neutralising 12 oz. citric acid with 11 oz. strong solution of ammonia, and adding distilled water to 1 pint. Contains 68 per cent. of $(NH_4)_3C_6H_5O_7$.

Diuretic.
Dose—½ to 1½ drams.

Liquor Ammonii Citratis. 1 in 4.

A colourless liquid, prepared by mixing 1 oz. of the above strong solution of citrate of ammonium with 3 oz. distilled water.

Diuretic.
Dose—2 to 6 drams.

Spiritus Ammoniæ Aromaticus. 1 of Carbonate and 2 of Liq. Ammon. Fort. in 40.

Known as "sal-volatile," an almost colourless liquid, prepared by *distilling* a mixture containing carbonate of ammonium, 4 oz.; strong solution of ammonia, 8 oz.; volatile oil of nutmeg, 4½ drs.; oil of lemon, 6½ drs.; rectified spirit, 6 pints; water, 3 pints. Only 8 pints are distilled over.

An agreeable stimulant. (Page 323.)

Dose—½ to 1 dram, freely diluted. It makes an elegant mixture when given with Tinct. Card. Co.

In—Tinctura Guaiaci Ammon. and Tinct. Valerianæ Ammon.

Spiritus Ammoniæ Fœtidus. 1 of Liq. Am. Fort. in 10.

Asafœtida, 1½ oz.; strong solution of ammonia, 2 oz.; rectified spirit, 1 pint (distil). A bright liquid, with a faint trace of colour.

Stimulant and Antispasmodic.
Dose—½ to 1 dram, diluted.

AMYGDALA AMARA (Bitter Almonds)—Rosaceæ.

The seed of the bitter almond tree (Amygdalus Communis). Has a bitter taste, is broader and shorter than the sweet almond, and its aqueous emulsion has odour of peach blossom.

Yields, when pressed, Oleum Amygdalæ.

Amygdala Dulcis (Sweet or Jordan Almonds)—Rosaceæ.

The seed of the sweet almond tree (Amygdalus Communis), from Malaga, about one inch in length, narrow, and sharp pointed, with clear brown seed coat, and a sweet taste.

Nutrient and Demulcent. (Page 324.)

Yields when pressed Oleum Amygdalæ, and enters into

Pulvis Amygdalæ Compositus. 8 in 13.

A powder of a dirty-white or pale straw-colour, composed of 8 oz. of *sweet* almonds (with their coats removed by steeping in hot water), 4 oz. sugar, and 1 oz. powdered gum acacia, rubbed into a coarse powder.

Used for making the mixture.

Mistura Amygdalæ. 1 in 8.

A white emulsion, made by rubbing 2 oz. of compound powder of almonds with 16 oz. of distilled water and straining.

Chiefly used as a vehicle for other medicines, and as a basis for lotions.

Dose—1 to 2 oz.

Oleum Amygdalæ (Almond Oil).

The pale yellow, almost inodorous, expressed oil from *bitter* or *sweet* almonds.

Demulcent and Emollient.

Dose—1 to 4 drams, in emulsion or mucilage.

Used in the preparations of simple, spermaceti, and resin ointments, and in phosphorated oil.

This harmless oil, which is commonly called almond oil, should not be confounded with the oil *distilled* from the bitter almond, which is known as the oil of bitter almonds, and which is a deadly poison, being four times the strength of Prussic acid. It is not, however, in the Pharmacopœia.

AMYL NITRIS (Nitrite of Amyl). $C_5H_{11}NO_2$.

An ethereal, yellowish liquid, with a peculiar odour, prepared by the action of nitric or nitrous acid on fousel oil.

Acts powerfully on arterial spasm. (Page 324.)

Dose—Internally, $\frac{1}{2}$ to 1 minim. The vapour of 2 to 5 minims, poured on the hand, may be inhaled. It should be used with caution.

AMYLUM (Starch)—From Graminaceæ.

Starch procured from the seeds of common wheat (Triticum Vulgare), from maize (Zea Mays), and from rice (Oryza sativa), in white columnar masses.

Dietetic and Demulcent. Antidote in poisoning by iodine.

In addition to the mucilage and glycerine, it enters into the suppositories of morphine with soap, and tannic acid with soap, and compound tragacanth powder.

Glycerinum Amyli. 1 *to* 8. 1 *in* $10\frac{1}{4}$ by weight.

A translucent jelly, prepared by heating 1 oz. starch, 5 oz. glycerine, and 3 oz. water.

An Emollient Application for External Use.

Mucilago Amyli. 12 grs. in 1 oz.

A thick, translucent mucilage, prepared by boiling 120 grs. starch with 10 oz. distilled water for a few minutes.

As a basis for enemas, into four of which it enters, *i.e.*, Aloes, Magnesii Sulphatis, Opii, and Terebinthinæ.

Preparations of iodine should not be ordered with starch.

ANETHI FRUCTUS (Dill Fruit)—Umbelliferæ.

The oval, flat, brown, seed-like fruit, $\frac{1}{6}$th of an inch long, with an aromatic odour, of Peucedanum graveolens (Anethum graveolens).

An Aromatic Stimulant. (Page 325.)

Dose—10 to 60 grs., in powder.

Aqua Anethi. 1 lb. to 1 gallon.

A colourless liquid, prepared by distilling 1 gallon from 1 lb. dill fruit and 2 gals. water.

Dose—$\frac{1}{2}$ to 2 oz. for adults. A favourite drug in the colic of infants. 1 to 2 drams for a child 1 year old.

Oleum Anethi.

The pale yellow oil, distilled in Britain from Dill fruit.

Antispasmodic and Carminative.

Dose—1 to 4 minims, on sugar.

***ANISI FRUCTUS** (Anise Fruit)—Umbelliferæ.

The dried fruit of Pimpinella Anisum, $\frac{1}{4}$th inch long, ovoid-oblong, greyish brown, and covered with hairs.

Antispasmodic and Carminative. (Page 325.)

***ANISI STELLATI FRUCTUS** (Star-Anise Fruit)—Magnoliaceæ.

The dried fruit of Illicium anisatum, from China, consisting of eight carpels arranged in the form of a star.

Antispasmodic and Carminative.

Conium Fruit is distinguished from Anise by its consisting of single mericarps, which are smooth and grooved.

***Aqua Anisi.** 1 lb. to 1 gallon.

A colourless water, obtained by distilling 1 gallon from 2 gallons water and 1 lb. anise fruit—(☞ *not star-anise*).

Carminative and Antispasmodic.

Dose—1 to 2 drams for a child one year old.

Oleum Anisi.

The colourless or very pale yellow oil distilled in Europe from anise fruit, or in China from star-anise fruit.

☞ The anise oil congeals at about 55° F.; the star-anise oil at about 33° F.

Antispasmodic and Carminative.

Dose—1 to 4 minims.

IN—Essentia Anisi and Tinct. Camphoræ Co., and Tinct. Opii Ammon.

Essentia Anisi. 1 in 5.

The colourless solution, prepared by mixing 1 oz. oil of anise with 4 oz. rectified spirit.

Carminative and Antispasmodic.
Dose—10 to 20 minims. For a child 1 year old, 3 minims.

ANTHEMIDIS FLORES (Chamomile Flowers)—Compositæ.

The dried single and double flower-heads of Anthemis nobilis, resembling dried daisy heads, from cultivated plants,
An Aromatic Stimulant and Bitter Tonic. (Page 325.)
Dose—10 to 30 grs.; generally given in the form of infusion.

Extractum Anthemidis.

A soft extract, prepared by evaporating a decoction of flowers, and adding 15 minims of oil of chamomile for every pound of flowers used.
Dose—2 to 10 grs.

Infusum Anthemidis. ½ oz. to ½ pint. (¼ hour).

Chamomile flowers ½ oz. infused in 10 oz. boiling water.
The warm infusion is Emetic in moderate doses.
Dose—1 to 4 oz.

Oleum Anthemidis.

The greenish blue or yellowish liquid oil distilled in Britain from chamomile flowers.
Used in making the extract.
Dose—1 to 4 minims; on sugar or in mucilage.

ANTIMONIUM NIGRUM PURIFICATUM. Sb_2S_3.

Purified black antimony, in the form of a greyish-black powder, being the native sulphide purified from siliceous matter by fusion, and from arsenic by maceration with solution of ammonia.

Used to make Antim. Sulphuratum and Liq. Antim. Chloridi.

Antimonii Oxidum. Sb_2O_3.

A greyish-white powder, prepared by pouring a solution of chloride of antimony into water, washing the oxychloride thus formed, and decomposing it by carbonate of sodium.
Diaphoretic and Emetic. (Page 327.)
Dose—1 to 4 grs. For a child 1 year old ⅙ to ¼ gr.
Used in the preparation of Antimon. Tartaratum, and in

Pulvis Antimonialis (Antimonial Powder). 1 in 3.

A substitute for James's powder; of a dull white colour, consisting of oxide of antimony 1 oz., and phosphate of calcium 2 oz.
Acts like the Oxide, only weaker.
Dose—3 to 5 grs. For a child 1 year old ¼ to ½ gr.

Antimonium Sulphuratum. Sb_2S_3 with Sb_2O_3.

An orange-red powder, known as sulphurated antimony, prepared by boiling black antimony with sublimed sulphur and solution of soda, adding diluted sulphuric acid to the solution before it cools, collecting and washing the precipitate.

Alterative, Emetic, and Diaphoretic.

Dose—1 to 5 grs Seldom given alone, but prescribed as Pilula Hydrargyri Subchloridi Composita—(1 in 5).

Liquor Antimonii Chloridi. $SbCl_3$. 1 lb. to 1 quart.

A heavy, reddish liquor, prepared by dissolving purified black antimony in hydrochloric acid, and concentrating. Known as Butter of Antimony.

Caustic. Not used internally. It contains 36 per cent. of Chloride of Antimony. Used in making Antim. Oxid.

Antimonium Tartaratum (Tartar Emetic).
$KSbOC_4H_4O_6,H_2O$.

An oxytartrate of antimony and potassium. In colourless, transparent crystals, with triangular facets ; soluble in water ; prepared by boiling together oxide of antimony and acid tartrate of potassium in water, filtering and collecting the crystals which form in the liquid.

Emetic, Cardiac Depressant, Expectorant.

Dose—As an emetic, 1 to 2 grs.; Diaphoretic, $\frac{1}{16}$ to $\frac{1}{6}$ gr.; as an Expectorant, $\frac{1}{8}$ to $\frac{1}{4}$. Given in solution in water.

Unguentum Antimonii Tartarati. 1 part in 5.

A white ointment, prepared by thoroughly mixing tartar emetic $\frac{1}{4}$ oz., and simple ointment 1 oz.

Vesicant and Rubefacient.

Vinum Antimoniale. 2 grs. in 1 oz.

Tartar emetic, 40 grs., dissolved in sherry, 1 pint ; making a pale, yellowish-brown liquid.

Dose—5 to 60 minims.

For a child 1 year old, 2 minims as an Expectorant.

***APOMORPHINÆ HYDROCHLORAS.** $C_{17}H_{17}NO_2HCl$.

(Hydrochlorate of Apomorphine). The hydrochlorate of an alkaloid, obtained by heating morphine or codeine in sealed tubes with hydrochloric acid, in white acicular crystals, turning green on exposure to light and air.

Powerfully Emetic and Expectorant. (Page 327.)

Dose—Emetic (by mouth), $\frac{1}{3}$ gr.; hypodermically, $\frac{1}{6}$ gr. As an Expectorant (by mouth), $\frac{1}{12}$ gr., in mixture.

***Injectio Apomorphinæ Hypodermica.** 1 in 50.

A solution of 2 grs. hydrochlorate of apomorphine in 100 minims of camphor water.

Dose—2 to 8 minims.

AQUA (Water). H_2O.

Natural water, as pure as can be obtained—filtered if necessary. In dispensing prescriptions, *aqua* should always mean distilled water.

Aqua Destillata. H_2O.

Water distilled from a copper still with a block-tin worm.

ARGENTUM PURIFICATUM (Pure Silver). **Ag.**

Used in preparing nitrate of silver. In leaf, for the coating of pills, and in the vessels used in making caustic potash.

Argenti Nitras. $AgNO_3$.

In flat, colourless crystals, or white rods. Prepared by evaporating a solution of silver in nitric acid, and drying the crystals. To make the rods commonly known as "Lunar Caustic," the fused crystals are poured into moulds; and to prepare "Toughened Nitrate of Silver," 5 per cent. of nitre is added to the nitrate of silver before fusion.

Caustic, Astringent, and Nerve Tonic. (Page 332.)

Dose—$\frac{1}{6}$ to $\frac{1}{3}$ gr. Sometimes given in doses of one grain in stomach affections, in pill.

As a strong caustic lotion for wounds, ulcers, &c., 1 dr. to 1 oz. As a lotion for ophthalmia in infants, 8 grs. to 1 oz. As an injection for the urethra, 2 grs. to 1 oz.

All solutions of caustic should be made with distilled water, and should not contain any trace of organic matter. Sometimes, however, the salt is dissolved in Spt. Æther. Nit.

***Argenti et Potassii Nitras.** (Mitigated Caustic).

White cylindrical rods or cones, prepared by fusion of 1 oz. nitrate of silver and 2 oz. nitrate of potassium.

Caustic.

Argenti Oxidum. Ag_2O.

The brown powder precipitated, on adding a solution of nitrate of silver to lime water.

Tonic and Antispasmodic.

Dose—$\frac{1}{2}$ to 2 grs., in pill. Pills containing this salt with organic matter, such as extracts, alkaloids, &c., often rapidly decompose and sometimes explode. (See page 53.)

AMORACIÆ RADIX (Horseradish Root)—Cruciferæ.

The fresh root of Cochlearia Armoracia, from plants cultivated in Britain, and collected in autumn or early spring, has often been unreasonably confounded with aconite. A comparison shows—

ACONITE ROOT	HORSE-RADISH ROOT
To be smaller, distinctly tapering to a point, brown on the exterior, odourless, and leaving a tingling sensation on being chewed.	To be larger, much longer, more uniform in circumference, white or cream coloured externally, with strong odour, especially on scraping, and with a characteristic taste.

Diuretic, Stimulant, and Sialagogue. (Page 333.)

Spiritus Armoraciæ Compositus. 1 in 8.

A colourless liquid, prepared by mixing 20 oz. of horse radish root, 20 oz. bitter-orange peel, ½ oz. nutmeg, 1 gallon proof spirit, and 3 pints water, and distilling 1 gallon. S.G. ·920.

Stimulant and Diuretic.

Dose—1 to 2 drams.

ARNICÆ RHIZOMA (Arnica Rhizome)—Compositæ.

The dried rhizome and rootlets of Arnica montana, from 1 to 3 inches long, and $\frac{1}{6}$ inch thick, round, twisted, and furnishing numerous long fibres. Its peppery taste and peculiar odour distinguish it from Senega, Serpentary, and Valerian, which it somewhat resembles.

Stimulant in low feverish conditions. (Page 333.)

Dose—10 grs., in powder.

Tinctura Arnicæ. 1 oz. to 1 pint.

A brandy-coloured liquid, obtained by the maceration and percolation of 1 oz. arnica rhizome with 1 pint rectified spirit.

Dose—½ to 1 dram. Chiefly used as a lotion for bruises, 1 oz. to 8 oz. water.

ARSENIC. (*Vide* Acid. Arseniosum—Page 161.)

ASAFŒTIDA (Asafœtida)—Umbelliferæ.

The fetid gum-resin, in irregular softish masses or tears, of a dull yellow and often pinkish colour, obtained from incisions into the living root of Narthex asafœtida (Ferula Narthex) and Ferula Scorodosma, and probably other species.

Stimulant and Antispasmodic. (Page 333.)

Dose—5 to 20 grs., in pills.

Enema Asafœtidæ. 30 grs. to 4 oz.

Prepared by rubbing 30 grs. asafœtida with 4 oz. distilled water, making a whitish emulsion.

Pilula Aloes et Asafœtidæ. 1 in 4.

Socotrine aloes, asafœtida, hard soap, and confection of roses of each 1 oz. well beaten together.

Cathartic and Antispasmodic.

Dose—5 to 10 grs.

Pilula Asafœtidæ Composita. 1 in $3\frac{1}{2}$.

Asafœtida, galbanum, and myrrh, of each 2 oz.; treacle, 1 oz.; heated by means of a water-bath, and stirred until of a uniform consistence.

A valuable Antispasmodic. Useful in hysteria.

Dose—5 to 10 grs.

Spiritus Ammoniæ Fœtidus. 33 grs. asafœtida in 1 oz.

A clear, faintly-yellow liquid, prepared by distilling a mixture of asafœtida $1\frac{1}{2}$ oz. and rectified spirit 15 oz., and adding to the distilled spirit 2 oz. strong solution of ammonia, with as much rectified spirit as will make the product measure 20 oz.

The best fluid form for prescribing asafœtida.

Dose—$\frac{1}{2}$ to 1 dram, diluted with water.

Tinctura Asafœtidæ. $2\frac{1}{2}$ oz. in 1 pint. ($54\frac{1}{2}$ grs. in 1 oz.)

A bright brown liquid, prepared by macerating $2\frac{1}{2}$ oz. asafœtida in 1 pint rectified spirit.

Dose—$\frac{1}{2}$ to 1 dram.

ATROPINA (Atropine). $C_{17}H_{23}NO_3$.

An alkaloid obtained from belladonna in the following manner:—A strong tincture is made by macerating belladonna root in rectified spirit; on adding slaked lime to this the alkaloid is set free along with colouring matters; sulphuric acid, poured upon the precipitate, forms sulphate of atropine, which is again decomposed by carbonate of potassium, and, on purification by charcoal, chloroform, and spirit, the alkaloid is obtained in colourless acicular crystals.

Sedative and Anodyne. A very active Poison. (Page 334.)

Dose—$\frac{1}{50}$ of a grain. Should not be given in this form.

***Lamellæ Atropinæ** (Discs of Atropine).

Discs of gelatine with some glycerine, each weighing about $\frac{1}{50}$ gr. and containing $\frac{1}{5000}$ gr. sulphate of atropine.

Unguentum Atropinæ. 8 grs. in 1 oz.

A white ointment, prepared by dissolving 8 grs. of atropine in ½ dram of spirit, and mixing with 1 oz. benzoated lard.

A Local Anodyne.

Atropinæ Sulphas.

A colourless powder, obtained by dissolving atropine in very dilute sulphuric acid, and evaporating.

Acts like atropine, and is very soluble. A powerful Poison.

Liquor Atropinæ Sulphatis. 1 in 100.

A colourless solution of 9 grs. sulphate of atropine in 16½ drs camphor water. Containing no spirit, its introduction into the eye does not cause pain.

Dose—1 to 4 minims, or two minims hypodermically.

AURANTII CORTEX (Bitter-Orange Peel)—Aurantiaceæ.

The dried thin outer part of the rind or pericarp of the bitter or Seville orange Citrus vulgaris (Citrus Bigaradia).

An Aromatic Bitter and Flavouring ingredient. (Page 336.)

In addition to the preparations bearing its name, it occurs in Infus. Gentianæ Co., Spirit. Armoraciæ Co., Tr. Cinchonæ Co., and Tr. Gentianæ Co.

Infusum Aurantii. ½ oz. to ½ pint (¼ hour).

Bitter-orange peel ½ oz. infused in boiling water ½ pint.

A mild Stomachic Tonic.

Dose—1 to 2 oz.

Infusum Aurantii Compositum. ¼ oz. to ½ pint (¼ hour).

Prepared by infusing in 10 oz. boiling water, ¼ oz. bitter-orange peel, 56 grs. fresh lemon peel, and 28 grs. of cloves.

Dose—1 to 2 oz.

Syrupus Aurantii. 1 in 8.

A flavouring syrup, prepared by adding 1 oz. tincture of orange peel to 7 oz. simple syrup.

Dose—1 dram.

In—Confectio Sulphuris.

Tinctura Aurantii. 2 oz. to 1 pint.

A golden, sherry-coloured tincture, prepared by macerating 2 oz. bitter-orange peel in 1 pint proof spirit.

An agreeable Tonic Bitter.

Dose—1 to 2 drams.

In—Mist. Ferri Aromat., Tinct. Quininæ, and Syrupus Aurantii.

AURANTII FRUCTUS (Bitter Orange).

The ripe fruit of Citrus vulgaris (Citrus Bigaradia).

Action as above.

Tinctura Aurantii Recentis. 6 oz. to 1 pint.

Prepared by macerating 6 oz. of the coloured part of the *fresh* rind of the bitter orange in 1 pint of rectified spirit.

Acts like the Tinct. Aurantii, but, having more oil in the fresh peel, its flavour is stronger.

Dose—1 to 2 drams.

Vinum Aurantii. 10 or 12 per cent. of alcohol.

Wine of a golden sherry colour, made in Britain by the fermentation of a saccharine solution, to which the fresh peel of the bitter-orange has been added.

An agreeable Bitter and Stimulating Tonic.

Dose—$\frac{1}{2}$ to 2 oz.

IN—Vinum Quininæ and Vinum Ferri Citratis.

Aqua Aurantii Floris (Orange-Flower water).

The nearly colourless fragrant distilled water of the flowers of the bitter and sweet orange trees.

Used for flavouring mixtures and draughts.

Syrupus Aurantii Floris. 1 in $6\frac{3}{4}$.

Prepared by dissolving 3 lb. of sugar in 16 oz. of distilled water, and adding 8 oz. of orange-flower water.

A sweet, colourless syrup, used for flavouring.

BALSAMUM PERUVIANUM—Leguminosæ.

A dark-brown, viscid, liquid balsam, exuded from Myroxylon Pereiræ (Toluifera Balsamum), after the bark has been beaten, scorched, and removed.

A stimulating Expectorant. Externally—A Stimulant to ulcers. (Page 336.)

Dose—10 to 15 minims, in mucilage or with beaten-up egg.

BALSAMUM TOLUTANUM—Leguminosæ.

A soft, fragrant, solid balsam, exuding from incisions in the bark of Myroxylon Toluifera (Toluifera Balsamum).

A weak Expectorant. (Page 336.)

Dose—10 to 20 grs., with mucilage or egg.

IN—Pil. Phosphori and Tr. Benzoini Co. and

Syrupus Tolutanus. 1 in 29.

Prepared by boiling $1\frac{1}{4}$ oz. balsam of tolu in 1 pint distilled water, filtering when cold, and adding 2 lb. sugar to make a colourless syrup.

Dose—1 dram. Chiefly used to sweeten cough mixtures.

Tinctura Tolutana. 2½ oz. to 1 pint.

A bright, reddish-brown liquid, prepared by dissolving 2½ oz. of tolu balsam in 1 pint of rectified spirit.

A Stimulating Expectorant.

Dose—20 to 40 minims, in emulsion or in sherry.

Used in the preparation of Morphine, Tannin, Opium, and "Morphine and Ipecac." lozenges.

BEBERINÆ SULPHAS (Sulphate of Beberine)—Lauraceæ

The sulphate of an alkaloid, in brown, thin, translucent scales, prepared from Nectandra bark, by treating it with weak sulphuric acid, precipitating the alkaloid with ammonia and lime, and, after acting on it with spirit and dilute sulphuric acid, evaporating.

Tonic and Antiperiodic. (Page 336.)

Dose—1 to 10 grs. in pill, or in solution with sulphuric acid.

BELÆ FRUCTUS (Bael Fruit)—Aurantiaceæ.

The dried half-ripe fruit of Ægle Marmelos, about the size of an orange, with a hard rind of greyish-brown colour, usually imported in dried, twisted slices.

Astringent. (Page 336.)

Extractum Belæ Liquidum. 1 in 1.

A deep brown-coloured liquid, prepared by evaporating an infusion of 1 pound bael fruit, made with 12 pints of cold distilled water, to 14 oz., and then adding 3 oz. rectified spirit.

Dose—1 to 2 drs., in Dysentery.

BELLADONNÆ FOLIA (Belladonna Leaves)—Solanaceæ.

The *fresh* ovate, acute, smooth leaves and young branches of deadly nightshade (Atropa Belladonna), also the leaves separated from the branches and *dried*, from wild and cultivated British plants, gathered when the fruit has begun to form.

Narcotic and Mydriatic. A powerful Poison. (Page 334.)

Extractum Belladonnæ.

A soft, dark-green extract, with a peculiar heavy odour, prepared from the juice of the fresh young leaves and branches of the belladonna by exactly the same process as that used in making extract of aconite, for which see p. 137 or 171.

Anodyne and Sedative.

Dose—$\frac{1}{4}$ to 1 gr., in pill, or, as an external application, mixed with as much glycerine as will make it into a cream.

Succus Belladonnæ.

The coffee-brown coloured juice of the young fresh leaves and branches of belladonna, with the addition of $\frac{1}{5}$ its bulk of rectified spirit.

Action—Anodyne. (Given in incontinence of urine and whooping cough).

Dose—5 to 15 minims.

Tinctura Belladonnæ. 1 oz. to 1 pint.

An olive-brown liquid, prepared by the maceration and percolation of 1 oz. dried belladonna leaves with 1 pint proof spirit.

Dose—5 to 20 minims. One minim for a child 1 year old.

BELLADONNÆ RADIX (Belladonna Root)—Solanaeeæ.

The dried, branched, whitish root, 1 to 2 feet long, of wild or cultivated plants of Atropa Belladonna, from Germany or Britain.

In action resembling the leaves.

Used in preparing Atropine and the following—

***Extractum Belladonnæ Alcoholicum.**

A dark semi-solid extract, prepared by evaporating on a water bath a tincture of dried belladonna root.

Dose—$\frac{1}{16}$ to $\frac{1}{4}$ gr.

Emplastrum Belladonnæ. 1 in 5.

Prepared by melting together on a water bath 4 oz. alcoholic extract of belladonna and 8 oz. each of soap and resin plasters.

A Local Anodyne.

Linimentum Belladonnæ. 1 part in $1\frac{1}{2}$.

A light yellowish-brown coloured liquid, prepared by the maceration and percolation of 20 oz. belladonna root and 1 oz. camphor, with 30 oz. rectified spirit.

A powerful Anodyne.

Unguentum Belladonnæ. 1 in 10.

A brownish ointment, made by rubbing 50 grs. of *alcoholic* extract of belladonna with 1 oz. benzoated lard.

A Soothing Application to Inflamed Piles.

BENZOINUM (Benzoin)—Styraeeæ.

The balsamic resin, in mottled masses or light-brown lumps made up of tears produced by making deep incisions into the bark of Styrax benzoin, and probably other species.

Diuretic and Expectorant. Seldom used internally.

Dose—5 to 10 grains of the powder, in milk. (Page 336.)

In—Adeps Benzoatus, Ungt. Cetacei, and the following :—

Tinctura Benzoini Composita. 2 oz. to 1 pint.

A dark reddish-brown liquid, prepared by maeerating 2 oz. benzoin, $1\frac{1}{2}$ oz. storax, $\frac{1}{2}$ oz. balsam of tolu, and 160 grs. Socotrine aloes in 1 pint rectified spirit.

A Stimulating Expectorant. Commonly known as Friar's balsam, and used as a protective coating for fresh wounds.

Dose—½ to 1 dram in emulsion. Water decomposes it.

Benzoic Acid and Preparations. (See Acidum Benzoicum).

BISMUTHUM (Bismuth)—**Bi.**

A crystalline metal used in preparing the following:—

BISMUTHUM PURIFICATUM (Pure Bismuth)—**Bi.**

In shining crystalline masses, of a greyish-white colour, with a rose tinge, produced by fusion of the impure metal with cyanide of potassium, sulphur, and subsequently with dried carbonates of sodium and potassium.

Bismuthi Carbonas. $(Bi_2O_2CO_3)_2,H_2O$.

A white powder, prepared by dissolving bismuth in nitric acid, and acting on the solution of the nitrate thus formed by solution of carbonate of ammonium, when the carbonate of bismuth is precipitated.

Antacid and Gastric Sedative. (Page 337.)

Dose—5 to 20 grs., suspended in a mixture with mucilage.

***Bismuthi Citras.** $BiC_6H_5O_7$.

A white powder, prepared by heating subnitrate of bismuth with nitric acid till dissolved, and adding water, and into this liquid pouring a solution of bicarbonate of sodium which has been boiled with citric acid, and purifying the resulting precipitate of citrate of bismuth.

Dose—2 to 5 grs.

Same action as Bismuthi Carbonas.

Liquor Bismuthi et Ammonii Citratis. 3 grs. Bi_2O_3 in 1 dram.

A colourless solution, prepared by rubbing 800 grs. citrate of bismuth with as much solution of ammonia as will dissolve it, and adding up to 20 oz. with distilled water.

Dose—½ to 1 dram, diluted.

***Bismuthi et Ammonii Citras.**

Small, shining translucent scales, obtained by evaporating liquor bismuthi, and allowing the concentrated liquid to dry upon glass or porcelain plates.

Dose—2 to 5 grs., as a gastric sedative.

Bismuthi Oxidum. Bi_2O_3.

A dull, lemon-yellow powder, prepared by boiling 1 lb. of subnitrate of bismuth with 4 pints of solution of soda washing and drying the residue.

Action and dose same as Bismuthi Carbonas.

Bismuthi Subnitras. $BiONO_3,H_2O$.

A heavy, white powder, prepared by dissolving bismuth in nitric acid, and pouring the solution into distilled water, when the salt is thrown down in minute crystalline scales.

Action and dose same as Bismuthi Carbonas.

Trochisci Bismuthi. 2 grs. in each.

Prepared by mixing subnitrate of bismuth, 1,440 grs.; carbonate of magnesium, 4 oz.; carbonate of calcium, 6 oz.; sugar, 29 oz.; gum acacia, 1 oz.; mucilage of gum acacia, 2 oz.; rose water, q.s., and dividing into 720 lozenges.

Dose—1 to 6 lozenges.

BORAX (Borax). $Na_2B_4O_7,10H_2O$.

A native salt, in large, transparent, colourless crystals. Can be also obtained by boiling together boric acid and carbonate of sodium.

Antiseptic, Emmenagogue and Diuretic. Locally, it has an Alterative action on mucous membranes. (Page 338.)

Dose—5 to 40 grs.

Used in making Acid. Boric.

Glycerinum Boracis. 1 to 6. (1 in 8 by weight.)

A colourless, liquid, prepared by dissoving 1 oz. borax in 4 oz. glycerine and 2 oz. distilled water.

Used for its soothing action on diseased mucous surfaces.

Mel Boracis. 46 grains in 1 oz.

A honey-like mixture of borax 60 grs., glycerine 30 grs., and honey, 480 grs.

Action similar to glycerine of borax.

BROMUM (Bromine). **Br.**

A dark-brown, pungent smelling liquid element, obtained from sea water, and some saline springs. Not used internally.

Caustic and Disinfectant.

Hydrobromic Acid. See under Acidum Hydrobromic Dilutum. (Page 167.)

Ammonii, Potassii, and Sodii Bromid. See under respective headings.

BUCHU FOLIA (Buchu Leaves)—Rutaceæ.

The dried leaves of three plants—Barosma betulina, Barosma crenulata, Barosma serratifolia. Small, pale-green, shining, and smooth leaves, with a powerful minty odour. Marked with pellucid dots at the indentations and apex.

A Stimulating Diuretic. (Page 341 and 506).
Dose—10 to 30 grs., in powder or infusion.

Infusum Buchu. ½ oz. to ½ pint (½ hour).
½ oz. bruised buchu leaves infused in 10 oz. boiling water.
Dose—1 to 4 oz.

Tinctura Buchu. 2½ oz. to 1 pint.
A brownish-green liquid, prepared by the maceration and percolation of 2½ oz. buchu leaves with 1 pint proof spirit,
Dose—1 to 2 drs.

***BUTYL-CHLORAL HYDRAS.** Hydrate of Butyl-Chloral $C_4H_5Cl_3O,H_2O$. (Croton-Chloral Hydrate, wrongly so called.)
Pearly white crystalline scales, with an odour like hydrate of chloral, produced by the action of dry chlorine on cooled aldehyd, separated by fractional distillation, and solidified by the addition of water.
Hypnotic and Anodyne to fifth nerve. (Page 342).
Dose—5 to 15 grs., in pills. (Page 52).

***CAFFEINA.** $C_8H_{10}N_4O_2,H_2O$. (Caffeine, Theine, or Guaranine).
An alkaloid in colourless silky crystals, obtained from the dried leaves of Camellia Thea, or the dried seeds of Coffea arabica, by evaporating aqueous infusions deprived of astringent and colouring matters.
Cardiac Tonic and Diuretic. (Page 343.)
Dose—1 to 5 grs., in mixture or pill.

***Caffeinæ Citras.** $C_8H_{10}N_4O_2,H_3C_6H_5O_7$.
A white, *inodorous* powder, prepared by dissolving 1 oz. caffeine, and 1 oz. citric acid in 2 oz. water, and evaporating.
Cardiac Tonic and Diuretic. (Page 343).
Dose—2 to 10 grs., in a mixture.

CAJUPUTI OLEUM (Oil of Cajuput)—Myrtaceæ.
A bright green mobile oil, with strong camphoraceous odour, distilled from the leaves of Melaleuca minor (M. Cajuputi).
A powerful diffusible Stimulant and Antispasmodic.
Dose—1 to 4 minims, on sugar, or in an emulsion. (P. 344.)

Spiritus Cajuputi. 1 in 50.
Oil of Cajuput 1 oz. mixed with rectified spirit 49 oz.
Dose—½ to 1 dram.
Ol. Cajuputi enters into Linimentum Crotonis.

***CALAMINA PRÆPARATA** (Prepared Calamine).

A pinkish powder, obtained by calcining native carbonate of zinc, and freeing it from gritty particles by elutriation. Not used internally. (Page 344).

***Unguentum Calaminæ.** 1 to 5.

A reddish ointment, prepared by mixing 1 oz. calamine with 5 oz. benzoated lard. (Formerly known at Turner's Cerate.)

A protective application to excoriated surfaces.

CALCII CARBONAS PRÆCIPITATA. $CaCO_3$.

A white crystalline powder, being one of the four official carbonates of calcium; prepared by mixing boiling solutions of carbonate of sodium and chloride of calcium.

Antacid and mildly Astringent. (Page 344.)

Dose—10 to 60 grs.

IN—Trochisci Bismuthi, 4 grs. in each.

The other carbonates of calcium are—Creta, Creta Præparata, and Marmor Album, which see.

Calcii Chloridum (Chloride of Calcium). $CaCl_2,2H_2O$.

In white agglutinated masses, prepared by neutralising hydrochloric acid with chalk, adding a little chlorinated lime and slaked lime, and evaporating the solution to dryness, and heating the residue at about 400°.

Alterative in Scrofula and Phthisis.

Dose—3 to 10 grs.

Chloride of calcium should not be confounded with the so-called chloride of lime.

***Liquor Calcii Chloridi.** 88 grs. to 1 oz.

A colourless solution of chloride of calcium 88 grs., in 1 oz. distilled water.

Dose—15 to 50 minims.

Calcii Hypophosphis. $Ca(PH_2O_2)_2$.

A white, pearly crystalline salt, prepared by heating phosphorus with slaked lime and water, and evaporating the solution after separating uncombined lime by carbonic acid gas.

Nervine Tonic. Recommended in early stages of Phthisis.

Dose—5 to 10 grs., in water.

Calcii Phosphas. $Ca_3P_2O_8$.

A light white amorphous powder, insoluble in water, prepared by dissolving bone ash in hydrochloric acid and water, and adding ammonia until the phosphate is thrown down.

Nervine Tonic. (Page 346.)
Dose—10 to 20 grs.
IN—Pulv. Antimonialis, 2 parts in 3. For bone ash see Os Ustum.

*Calcii Sulphas. $CaSO_4.2H_2O$.

Native sulphate of calcium rendered nearly anhydrous by heat.
Only used to make Calx sulphurata.

CALX (Lime). CaO.

Oxide of calcium in compact whitish masses, obtained by burning chalk or limestone $CaCO_3$.
Caustic. (Page 345).

Calcii Hydras. $Ca(HO)_2$.

A white powder, known as slaked lime, prepared by adding about half its weight of water to lime and sifting.
Caustic.

Liquor Calcis. ½ gr. in 1 oz.

"Lime water," prepared by washing slaked lime 2 oz., adding water 1 gallon, and decanting the clear colourless liquid.
Antacid and Astringent.
Dose—1 to 4 oz., in milk; ½ to 1 dr. for a child one year old.
Used in the preparation of Argenti Oxid., Liniment. Calcis, Lotio Hydrarg. Flava, Lotio Hydrarg. Nigra.

Liquor Calcis Saccharatus. 7 grs. in 1 oz.

The colourless or slightly yellow liquid, prepared by adding slaked lime 1 oz., sugar 2 oz., to water 1 pint, mixing and decanting.
Same as Liquor Calcis in action.
Dose—15 to 60 minims, in water or milk.

Linimentum Calcis. 1 in 2.

Lime water and olive oil, of each 2 oz. (mixed), forming a thick, whitish emulsion, known as Carron oil.
Sedative application to burns and scalds.
The original Carron oil was made with Linseed oil.

Calx Chlorinata. $CaCl_2$, $CaCl_2O_2$, or $CaOCl_2$.

(Chlorinated Lime). A dirty-white powder, obtained when slaked lime is exposed to the action of chlorine gas, as long as the latter is absorbed. It is known as bleaching powder. It has bleaching and disinfecting properties, and is astringent.

Liquor Calcis Chlorinatæ. 1 lb. to 1 gal.

A colourless filtered solution of chlorinated lime in water.

Astringent and Antiseptic.

Dose—10 to 30 minims, freely diluted. Chiefly used as a deodoriser. (Contains 2 to 3 per cent. available chlorine.)

Vapor Chlori (Inhalation of Chlorine).

2 oz. chlorinated lime, moistened with a sufficiency of cold water, so that the vapour arising may be inhaled.

***Calx Sulphurata** (Sulphurated Lime or Sulphide of Calcium).

A dirty-white, foul smelling powder, containing not less than 50 per cent. of sulphide of calcium (CaS), prepared by heating to redness in a crucible 7 oz. sulphate of calcium and 1 oz. wood charcoal.

Antisuppurative. (Page 348.)

Dose—$\frac{1}{10}$ to 1 grain in pill (see page 54).

CALUMBÆ RADIX (Calumba Root)—Menispermaceæ.

The dried root (cut in round or oval flat yellow slices, with radiating lines) of Jateorrhiza Calumba (Cocculus palmatus).

A Bitter Tonic, without Astringency. (Page 348.)

Dose—5 to 20 grs. in powder. Seldom given in this form.

Extractum Calumbæ.

A dark, soft extract, prepared by evaporating a tincture of calumba root made with proof spirit.

Dose—2 to 10 grs., in pills.

Infusum Calumbæ. $\frac{1}{2}$ oz. to 10 oz., cold ($\frac{1}{2}$ hour).

Prepared by macerating $\frac{1}{2}$ oz. calumba root in $\frac{1}{2}$ pint of *cold* water.

Dose—1 to 2 oz.

Tictura Calumbæ. $2\frac{1}{2}$ oz. to 1 pint.

A greenish-brown liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. calumba root with 1 pint proof spirit.

Dose—$\frac{1}{2}$ to 2 drams.

As calumba root and its preparations do not contain any tannin, they can be ordered with all the preparations of iron. Cold water is used in making the infusion, lest any of the starch should be extracted.

In addition to the above, calumba root enters into Mist. Ferri Aromat.

CAMBOGIA (Gamboge)—Guttiferæ.

A gum-resin in yellow cylindrical pieces, obtained from wounds in the bark of Garcinia Hanburii (Garcinia morella).

A Hydragogue Drastic Cathartic. (Page 349.)

Dose—1 to 4 grs., in pill.

Pilula Cambogiæ Composita. 1 in 6.

Composed of gamboge, Barbadoes aloes, compound cinnamon powder, of each 1 oz.; hard soap, 2 oz.; syrup, q.s.

A Cathartic Pill, causing watery evacuations.

Dose—5 to 10 grs.

CAMPHORA (Camphor)—Lauraceæ.

A stearoptene or volatile oil, in translucent, white, crystalline masses, obtained from the wood of Cinnamomum Camphora (Camphora officinarum), purified by sublimation in England.

A diffusible Stimulant and Antispasmodic. (Page 349.)

Dose—1 to 10 grs., in pill.

In addition to the preparations bearing the name, camphor enters into Ungt. Hydrarg. Co., and into 11 of the 16 liniments of the Pharmacopœia.

Aqua Camphoræ. About ½ gr. in 1 oz.

Water flavoured with camphor. Prepared by immersing ½ oz. camphor, tied in muslin, in 1 gallon water.

Only a vehicle for more active remedies.

IN—Injectio Hypoderm. Apomorphinæ and Ergotinæ, and Liq. Atropinæ Sulph.

Linimentum Camphoræ. 1 in 5 nearly.

A yellow, oily liquid, prepared by dissolving 1 oz. camphor in 4 oz. olive oil.

A Stimulating Application in chronic painful affections.

IN—Lin. Chlorof., Lin. Hydrarg., and Lin. Tereb. Acet.

Linimentum Camphoræ Compositum. 1 *to* 8. 1 in 9.

A faintly yellowish liquid, prepared by dissolving 2½ oz. camphor in 15 oz. rectified spirit, and adding 1 dr. oil of lavender and 5 oz. strong solution of ammonia.

A safe and effectual Rubefacient and Counter-irritant.

In absence of other remedies, it may be used as a general diffusible stimulant in 20 minim doses, largely diluted.

Spiritus Camphoræ. 1 in 10.

Prepared by dissolving 1 oz. camphor in 9 oz. rectified spirit.

Dose—10 to 30 minims in emulsion.

Tinctura Camphoræ Composita. 1½ grs. camphor and 2 grs. opium in 1 oz.

A bright, sherry-coloured liquid, commonly known as Paregoric, prepared by macerating 40 grs. each opium and benzoic acid with 30 grs. camphor and 30 minims oil of anise in 1 pint proof spirit.

Narcotic, Anodyne, and Expectorant.

Dose—15 to 60 minims.

CANELLÆ CORTEX (Canella Bark)—Canellaceæ.

The nearly white bark, deprived of its corky layer, in quills or curved pieces, of Canella alba, with clove-like odour and peppery taste.

An Aromatic Tonic, introduced to flavour Vinum Rhei.

Dose—10 to 30 grs., in powder.

CANNABIS INDICA (Indian Hemp)—Urticaceæ.

The dried flowering tops of the female plant of Cannabis sativa, from which the resin has not been removed, grown in India; in elongated compressed bundles of a greenish-brown colour, in which may be recognised the flowers, young branches, smaller leaves, and the well-known fruits commonly called hemp seeds. (Known in India as Gunjah.)

Anodyne and Narcotic. (Page 350.)

Extractum Cannabis Indicæ.

A rich green resinous extract, prepared from the tops by macerating in spirit, and evaporating the tincture thus formed.

Anodyne and Narcotic, like Opium.

Dose—$\frac{1}{4}$ to 1 grain, in pill.

Tinctura Cannabis Indicæ. 1 oz. to 1 pint.

A deep-green liquid, prepared by dissolving 1 oz. of the extract in 1 pint rectified spirit.

Dose—5 to 20 minims, in mucilage or wine. (See page 36.)

CANTHARIS (Cantharides)—Coleoptera.

The dried beetle Cantharis vesicatoria of the order of Coleoptera, $\frac{3}{4}$ inch long, with bright metallic green wing covers: the powder is greyish-brown, with shining green particles.

Vesicant, Counter-irritant, and Diuretic. (Page 351.)

Acetum Cantharidis. 1 in 10.

A dark brown coloured liquid, prepared from 2 oz. cantharides by digestion at 200° and percolation with 18 oz. acetic acid and 2 oz. glacial acetic acid.

Epispastic. Not used internally.

Emplastrum Cantharidis. 1 in 3.

A brownish substance, of the consistence of firm ointment, with dark green shining particles, prepared by heating 12 oz. cantharides (in powder), 7½ oz. yellow wax, 7½ oz. suet, 3 oz. resin, and 6 oz. lard. Known as blistering plaster.

Vesicant. Generally blisters in from 6 to 9 hours.

Emplastrum Calefaciens. 1 in 24. (Warm plaster.)

Prepared by adding to a strong infusion of 4 oz. of cantharides, 4 oz. each of expressed oil of nutmeg, yellow wax and

resin, 3¼ lbs. resin plaster, and 2 lbs. soap plaster previously heated, mixing and making a firm plaster of a yellow colour.

A mild Stimulating application.

Tinctura Cantharidis. ¼ oz. to 1 pint.

A pale straw-coloured liquid, prepared by macerating ¼ oz. cantharides in 1 pint proof spirit.

Diuretic and Stimulant to the genito-urinary organs.

Dose—5 to 20 minims diluted with a mucilaginous liquid.

Unguentum Cantharidis. 1 to 7.

An ointment of a yellowish brown colour, prepared by heating 1 oz. cantharides in 6 oz. olive oil, and after straining out the cantharides, adding 1 oz. yellow wax to the heated oil.

Rubefacient. Milder than Emplastrum Cantharidis.

Charta Epispastica (Blistering Paper).

White paper coated on one side with a mixture made by heating together white wax 4 oz., spermaceti 1½ oz., olive oil 2 oz. resin, ¾ oz. Canada balsam, ¼ oz. cantharides, 1 oz., with 6 oz. water.

Rubefacient and Vesicant. Acts like Emplastrum Cantharidis.

***Collodium Vesicans** (Blistering Collodion).

Prepared by adding 1 oz. pyroxylin to 20 oz. blistering liquid.

Vesicant—like Emplastrum and Liquor.

Liquor Epispasticus. 1 in 4. (Blistering Liquid.)

A bright greenish brown, ethereal liquid, prepared by percolating 5 oz. cantharides with 1 pint acetic ether.

Acts like Emplastrum, but more rapidly.

CAPSICI FRUCTUS (Capsicum Fruit)—Solanaceæ.

A small oblong orange pod, containing flat white seeds, the fruit of Capsicum fastigiatum, known as Cayenne pepper.

A powerful Stimulant and Rubefacient, without blistering.

Dose—½ to 1 gr. 30 grs. in Delirium Tremens. (Page 353.)

Tinctura Capsici. ¾ oz. to 1 pint.

A brandy-coloured liquid, prepared by macerating and percolating ¾ oz. capsicum fruit with 1 pint rectified spirit.

Dose—10 to 20 minims diluted. As a gargle in relaxed throat, 1 dram in 10 oz. Infusion of Roses.

CARBO ANIMALIS (Animal Charcoal or Bone Black).

The residue of bones which have been exposed to a red heat without the access of air, consisting of carbon and phosphate and carbonate of calcium.

Carbo Animalis Purificatus.

A black powder, prepared by depriving animal charcoal of its salts, by digestion in hydrochloric acid, and calcining.

Chiefly employed as a Deodoriser and Bleacher, and recommended as an antidote in poisoning by alkaloids. (Page 354.)

Dose—20 to 60 grs.

CARBO LIGNI (Wood Charcoal).

In black, brittle, porous masses, prepared by charring wood in a confined space without access of air.

Deodoriser and Absorbent in fetid eructations.

Dose—20 to 60 grs. in powder; or, sprinkled over foul sores.

Cataplasma Carbonis. 1 in 28.

A poultice, made of powdered wood charcoal, ½ oz.; crumb of bread, 2 oz.; linseed meal, 1½ oz.; boiling water, 10 oz.

CARDAMOMI SEMINA (Cardamoms)—Zingiberaceæ.

The small dried ripe angular brown seeds of Elettaria Cardamomum, kept in their triangular pericarps till required.

Carminative, Tonic, and Antispasmodic. (Page 355.)

Dose—In powder, 5 to 20 grs.

Tinctura Cardamomi Composita. ¼ oz. to 1 pint.

A bright red liquid, prepared by macerating and percolating ¼ oz. cardamom seeds, ¼ oz. caraway fruit, 2 oz. raisins, ½ oz. cinnamon, 55 grs. cochineal, with 1 pint proof spirit.

An agreeable carminative, but chiefly used for its flavour and bright-red colour as an addition to draughts and mixtures.

Dose—½ to 2 drams, in water.

In addition to the tincture, cardamom seeds enter into the following:—Ext. Col. Co., Pulv. Cinnam. Co., Pulv. Cretæ Arom., Tr. Gent. Co., Tr. Rhei, Vin. Aloes; and the Tincture itself enters into Dec. Aloes Co., Mist. Ferri Aromat., Mist. Sennæ Co., and Tr. Chloroformi Co.

CARUI FRUCTUS (Caraway fruit)—Umbelliferæ.

The minute brown aromatic seed-like fruits of Carum Carui tapering at each end, and marked with five ridges.

Carminative, Stimulant, and Antispasmodic. (Page 355.)

In Confect. Opii and Piperis., Pulv. Opii Co., Tr. Card. Co. and Tr. Sennæ.

Aqua Carui. 1 lb. to 1 gallon.

A colourless water, prepared by distilling 1 gallon of water from 1 lb. of caraway fruit, and 2 gallons of water.

Dose—1 to 2 oz.

Oleum Carui.

The faint-yellow oil distilled in Britain from Caraway fruit.

Dose—1 to 4 minims, on sugar.

In—Confectio Scammonii and Pilula Aloes Barb.

CARYOPHYLLUM (Clove)—Myrtaceæ.

The dried unexpanded flower buds of Eugenia caryophyllata (Caryophyllus aromaticus); with a cylindrical body, spherical head, and four teeth.

Carminative, Stimulating Aromatic, and Tonic. (Page 355.)

In—Infus. Aurant. Co., Mist. Ferri. Aromat., and Vin. Opii.

Infusum Caryophylli. $\frac{1}{4}$ oz. to $\frac{1}{2}$ pint ($\frac{1}{2}$ hour).

Prepared by infusing $\frac{1}{4}$ oz. cloves in 10 oz. boiling water.

Dose—1 to 4 oz.

Oleum Caryophylli.

The clear, yellowish oil distilled in Britain from cloves.

Antispasmodic, Stimulant, and powerfully Antiseptic.

Dose—1 to 4 minims, on sugar.

In—Confect. Scammonii, Pil. Col. Co., and Pil. Col. Co. et Hyoscyami.

***CASCARA SAGRADA** (see Rhamni Purshiani Cortex).

CASCARILLÆ CORTEX (Cascarilla Bark)—Euphorbiaceæ.

The bark of Croton Eluteria in small, dull-brown quills (coated with lichens) covered with a brown separable corky layer.

An Aromatic Bitter Tonic. (Page 356.)

Infusum Cascarillæ. 1 oz. to $\frac{1}{2}$ pint ($\frac{1}{2}$ hour)

Prepared by infusing 1 oz. cascarilla in 10 oz. boiling water.

Dose—1 to 2 oz.

Tinctura Cascarillæ. $2\frac{1}{2}$ oz. to 1 pint.

A dark brown liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. of powdered cascarilla with 1 pint proof spirit.

Dose—$\frac{1}{2}$ to 2 drams, diluted.

CASSIÆ PULPA (Cassia Pulp)—Leguminosæ.

The soft, sweet, brown pulp (with shining seeds) obtained from the recently imported pods of Cassia Fistula.

Laxative. Used as an addition to senna in Confectio Sennæ.

CATECHU (Catechu)—Cinchonaceæ.

An extract of the leaves and shoots of Uncaria Gambier in variably sized masses, or hard cubes (1 inch square), brown externally, yellow internally. Known as Pale Catechu.

A Tonic Astringent. (Page 357.)

Dose—10 to 30 grs., in powder.

Infusum Catechu. 160 grs. to ½ pint (½ hour).

Prepared by infusing 160 grs. catechu and 30 grs. cinnamon in 10 oz. boiling water.

Dose—1 to 2 oz. As the catechu preparations contain so much tannin, they cannot be given with preparations of iron.

Tinctura Catechu. 2½ oz. to 1 pint.

A rich coffee-brown liquid, prepared by macerating 2½ oz. of catechu and 1 oz. cinnamon in 1 pint proof spirit.

Dose—½ to 2 drams. A safe Astringent for children; dose, 5 to 10 minims for a child 1 year old.

Pulvis Catechu Compositus. 1 in 2½.

A reddish-brown powder, consisting of catechu 4 oz.; kino and rhatany, of each 2 oz.; cinnamon and nutmeg, of each 1 oz.

A Tonic Astringent in chronic diarrhœa.

Dose—20 to 40 grs.; for a child 1 year old, 2 to 5 grs.

Trochisci Catechu. 1 gr. in each lozenge.

Brownish lozenges, consisting of—catechu, 720 grs.; sugar, 25 oz.; gum acacia, 1 oz.; mucilage of gum acacia, 2 oz.; water q.s., divided into 720 lozenges.

Local Astringent for relaxed throat.

Dose—1 to 6 lozenges.

CERA ALBA (White Wax).

Yellow wax, bleached by exposure to moisture, air, and light; in nearly white, translucent masses or cakes.

In—Charta Epispastica, Ungt. Cetacei, and Ungt. Simplex

CERA FLAVA (Yellow Wax)—Hymenoptera.

The prepared honey-comb of the hive bee, Apis mellifica, in firm, yellow masses.

Used chiefly as a basis for ointments and plasters; it enters into 6 ointments, 5 plasters, and Pil. Phosphori.

CEREVISIÆ FERMENTUM (Barm, or Beer Yeast).

The viscid, semi-fluid, frothy ferment obtained in brewing beer, and produced by Saccharomyces (Torula) cerevisiæ.

A Tonic Stimulant in low states of the system. (Page 358.)

Dose—½ to 1 oz., in some flavoured water.

Cataplasma Fermenti. (Yeast Poultice).

Prepared by mixing 6 oz. yeast with 6 oz. water at 100° and 14 oz. wheaten flour, and allowing the mass to "rise."

A Stimulating Deodoriser to foul sores.

CERII OXALAS (Oxalate of Cerium). $CeC_2O_4,3H_2O$.

A white granular precipitate, obtained by mixing solutions of oxalate of ammonium and any soluble salt of cerium. It usually contains oxalates of lanthanum and didymium.

A Gastric sedative like bismuth; given in the vomiting of pregnancy. (Page 358.)

Dose—1 to 2 grs. in a pill.

CETACEUM (Spermaceti).

A concrete fatty substance, in pearly, lustrous masses, obtained from the head of the Sperm whale (Physeter Macrocephalus), separated from oil by filtration and pressure.

Internally, Demulcent; externally, Emollient. (Page 358.)

IN—Charta Epispastica, and

Unguentum Cetacei. 1 in $5\frac{1}{2}$.

A pearly-white ointment, prepared by melting 5 oz. spermaceti, 2 oz. white wax, 1 pint almond oil, and $\frac{1}{2}$ oz. benzoin.

An Emollient dressing for sores or blisters.

CETRARIA (Iceland Moss)—Lichenes.

The leafy, crisp, brownish-white lichen, Cetraria islandica.

Decoctum Cetrariæ. 1 oz. to 1 pint.

Prepared by boiling 1 oz. Iceland moss with 20 oz. of water for 10 minutes, and making the strained product measure 20. oz.

Demulcent and Nutritive Tonic. (Page 358.)

Dose—1 to 4 oz. (Or as a basis for cough mixtures.)

CHARTA EPISPASTICA.—(See Cantharides).

CHIRATA (Chiretta)—Gentianaceæ.

The dried plant Ophelia Chirata, collected when the fruit begins to form. The unbranched root 3 inches and hollow stems 3 feet long, about the size of goose quills, with opposite branches and panicled flowers.

A pure bitter Tonic, like gentian. (Page 358.)

Infusum Chiratæ. $\frac{1}{4}$ oz. to $\frac{1}{2}$ pint ($\frac{1}{2}$ hour).

Prepared by infusing $\frac{1}{4}$ oz. chiretta in 10 oz. water at 120°.

Dose—1 to 2 oz.

Tinctura Chiratæ. $2\frac{1}{2}$ oz. to 1 pint.

A tea-coloured liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. chiretta with 1 pint proof spirit.

Dose—$\frac{1}{2}$ to 2 drams.

CHLORAL HYDRAS (Hydrate of Chloral). C_2HCl_3O,H_2O.

In colourless crystals, prepared by the action of dry chlorine gas on anhydrous alcohol, and the chloral thus produced purified by sulphuric acid and lime, and converted into the hydrate by the addition of water.

Hypnotic and Sedative. (Page 358).

Dose—5 to 30 grs., in flavoured water with syrup.

Syrupus Chloral. 10 grs. in 1 dr.

A colourless syrup, prepared by dissolving 80 grs. hydrate of chloral in 1½ drs. water, and adding simple syrup to 1 oz.

Dose—½ to 2 drs.

CHLORINE (Cl.)

Only used in the following forms:—

Liquor Chlori. 2·66 grs. Cl. in 1 oz.

Chlorine gas dissolved in water, forming a yellowish-green liquid, prepared by acting on the black oxide of manganese with hydrochloric acid, and passing the gas through water.

Antiseptic and Deodorant. (Page 360.)

Dose—10 to 20 minims, diluted. Externally for foul ulcers.

Vapor Chlori. (Inhalation of Chlorine.)

2 oz. chlorinated lime put into an inhaler and moistened with cold water, so that the vapour may be inhaled.

For other Preparations of Chlorine, see under "Soda" and "Calx."

CHLOROFORMUM (Chloroform).—$CHCl_3$.

A limpid, colourless liquid, prepared by distilling diluted alcohol with lime and chlorinated lime, and purifying the crude chloroform by washing with water and sulphuric acid, and by distillation with lime and chloride of calcium. 1 per cent. ethylic alcohol is added at the end of the process.

Sedative, Narcotic, Anodyne, either swallowed or inhaled. Externally, a Vesicant, Rubefacient or Anodyne. (Page 360.)

Dose—3 to 10 minims, freely diluted with water.

Aqua Chloroformi. 1 in 200.

A colourless solution of 1 dram of chloroform in 25 oz. of distilled water.

Used chiefly as a vehicle for more active preparations.

Dose—½ to 2 oz.

Linimentum Chloroformi. 1 in 2.

A pale-yellow liquid, prepared by mixing 2 oz. chloroform with 2 oz. camphor liniment.

Rubefacient and Anodyne.

Spiritus Chloroformi. 1 in 20. (Chloric Ether.)

A colourless liquid, prepared by dissolving 1 oz. chloroform in 19 oz. rectified spirit.

Dose—20 to 60 minims, in water.

Tinctura Chloroformi Composita. 1 in 10.

A brilliant red liquid, consisting of 2 oz. chloroform, 8 oz. rectified spirit, and 10 oz. compound tincture of cardamoms.

Dose—20 to 60 minims.

***Tinctura Chloroformi et Morphinæ.** 1 in 8.

Contains $1\frac{1}{4}$ min. of chloroform and $\frac{1}{48}$ gr. morphine in 10 minims. Apparently introduced as a substitute for Chlorodyne, which it somewhat resembles, and consisting of 1 oz. chloroform, 2 drs. ether, 1 oz. spirit, 8 grs. hydrochlorate of morphine, $\frac{1}{2}$ oz. diluted hydrocyanic acid, 4 mins. oil of peppermint, 1 oz. liquid extract of liquorice, 1 oz. treacle, and syrup to 8 oz.

Anodyne, Narcotic, and Antispasmodic.

Dose—5 to 10 minims.

***CHRYSAROBINUM** (Chrysarobin, Araroba, or Goa powder)—Leguminosæ.

A yellowish crystallised powder, being the dried and powdered medullary matter of the stem and branches of Andira araroba, containing a variable amount of chrysophanic acid.

Antiparasitic in Skin Diseases. (Page 364.)

Dose—$\frac{1}{6}$ to $\frac{1}{2}$ gr. ($\frac{1}{10}$ gr. sometimes will cause gastritis.)

***Unguentum Chrysarobini.** 1 in 25.

A yellowish ointment, prepared by dissolving with heat 20 grs. chrysarobin in 180 grs. benzoated lard.

Antiparasitic and Stimulating application in skin diseases.

***CIMICIFUGÆ RHIZOMA** (Cimicifuga, or Actæa Root)—Ranunculaceæ.

The dried, brownish-black, flattened-cylindrical rhizome, and small, wiry, brittle branched rootlets of Cimicifuga racemosa (Actæa racemosa).

Cardiac Tonic, Expectorant, and Antirheumatic. (P. 365.)

***Extractum Cimicifugæ Liquidum.** 1 in 1.

Prepared by evaporating a strong tincture of cimicifuga and dissolving the extract so formed in rectified spirit.

Dose—3 to 30 minims.

*Tinctura Cimicifugæ. 2½ oz. to 1 pint.

Prepared by macerating and percolating 2½ oz. cimicifuga (in No. 40 powder) with proof spirit 1 pint.

Dose—15 to 60 minims.

CINCHONÆ CORTEX (Cinchona Bark)—Cinchonaceæ.

The P.B. now recognises the following barks :—

(1) Cinchona succirubra (red bark).
(2) Cinchona Calisaya (yellow bark).
(3) Cinchona officinalis (pale bark).
(4) Cinchona lancifolia.
(5) Other unnamed species of Cinchona.
(6) Certain unnamed species of Remijia.

From any of these may be obtained :—

Cinchoninæ Sulphas.
Cinchonidinæ Sulphas.
Quininæ Hydrochloras.
Quininæ Sulphas.

☞ In all the Galenical preparations the *red* bark only is permitted.

CINCHONÆ RUBRÆ CORTEX (Red Cinchona Bark).

The dried bark of the stem and branches of *cultivated* plants of Cinchona succirubra, in quills or incurved pieces, coated with periderm ; bark itself $\frac{1}{10}$ to $\frac{1}{4}$ inch thick, outer surface roughened by fissures, cracks, and warts, and brownish-red, inner surface brick-red. It should yield between 5 and 6 per cent. of total alkaloids, half of which should consist of quinine and cinchonidine.

Antiperiodic, Tonic, Antipyretic, and Astringent. (Page 365.)

Dose—Of the powder, which is brown or reddish-brown, 10 to 60 grs.

Decoctum Cinchonæ. 1¼ oz to. 1 pint.

A reddish, muddy liquid, prepared by boiling 1¼ oz. red bark in 1 pint distilled water for 10 minutes, straining when cold, and making the strained product to measure 1 pint.

Dose—1 to 2 oz. Mixtures containing it require to be shaken.

Extractum Cinchonæ Liquidum. 1 in 1. (5 per cent. alkaloids).

A brownish liquid, prepared by exhausting 20 oz. red cinchona bark with hydrochloric acid, glycerine, spirit, and water, and evaporating to 1 pint, determining the alkaloidal strength of this and by evaporating further, or adding water and spirit, making the finished liquid contain 5 grs. of alkaloids in every 100 grs.

Dose—5 to 10 minims.

Infusum Cinchonæ Acidum. ½ oz. to 10 oz. (1 hour.)

Prepared by infusing for one hour ½ oz. red bark (in No. 40 powder) and 1 dr. aromatic sulphuric acid in ½ pint boiling water.

Dose—1 to 2 oz.

Tinctura Cinchonæ. 4 oz. to 1 pint.

A reddish-brown liquid, prepared by macerating and percolating 4 oz. red bark (in No. 40 powder) with 1 pint proof spirit.

Dose—½ to 2 drams.

Tinctura Cinchonæ Composita. 2 oz. to 1 pint.

A reddish-yellow liquid, prepared by macerating and percolating 2 oz. red bark, 1 oz. bitter-orange peel, ½ oz. serpentary rhizome, 55 grs. saffron, and 28 grs. cochineal in 1 pint proof spirit.

Tonic and Astringent.

Dose—½ to 2 drams.

Red cinchona bark also enters into Mistura Ferri Aromat

***CINCHONIDINÆ SULPHAS** (Sulphate of Cinchonidine) $(C_{20}H_{21}N_2O)_2,H_2SO_4,3H_2O$.

The sulphate of an alkaloid, in colourless, silky crystals, obtained from the bark of various species of cinchona, by concentrating the mother-liquors of the crystallisation of sulphate of quinine, and purifying by recrystallisation from alcohol and finally from hot water.

Antipyretic and Tonic—resembling quinine. (Page 369.)

Dose—1 to 10 grs., in water, in which it is soluble.

***CINCHONINÆ SULPHAS.** (Sulphate of Cinchonine.) $(C_{20}H_{21}N_2O)_2,H_2SO_4,2H_2O$.

The sulphate of an alkaloid, in hard, colourless, prismatic crystals, obtained from the bark of various species of Cinchona or Remijia, by adding caustic soda to the mother liquors of the crystallisation of the sulphates of quinine, cinchonidine, and quinidine, washing the precipitate so formed with spirit, dissolving in sulphuric acid, and purifying with animal charcoal.

Action and Dose—Same as Sulphate of Cinchonidine.

CINNAMOMI CORTEX (Cinnamon Bark)—Lauraceæ.

In light, yellowish-brown, closely-rolled, very thin, splintery quills, being the inner bark of the young shoots from the truncated stocks of the cultivated Cinnamomum zeylanicum from Ceylon, and known as Ceylon Cinnamon.

A stimulating Aromatic, and Stomachic. (Page 370.)
Dose—10 to 20 grs., in powder.

Aqua Cinnamomi. 20 oz. to 1 gallon.

A colourless water, prepared by distilling 1 gallon from 20 oz. cinnamon and 2 gallons water.

Dose—1 in 2 oz.

IN—Mist. Cretæ, Mist. Guaiaci, and Mist. Spt. Vini Gallici.

Oleum Cinnamomi.

The fresh, yellow oil distilled from Cinnamon bark; becomes red with age. *It sinks in water.*

Dose—1 to 4 minims, on sugar or in mucilage.

Pulvis Cinnamomi Compositus. 1 in 3.

A pale brown powder, consisting of cinnamon, cardamoms and ginger—of each 1 oz. Known as Pulvis Aromaticus.

Dose—3 to 10 grs.

IN—Pil. Aloes et Ferri and Pil. Cambogiæ Co.

***Spiritus Cinnamomi.** 1 in 50.

1 oz. oil of cinnamon and 49 oz. rectified spirit.

Dose—½ to 1 dram.

IN—Acid. Sulphuric. Aromat.

Tinctura Cinnamomi. 2½ oz. to 1 pint.

A reddish-brown liquid, prepared by macerating and percolating 2½ oz. of cinnamon with 1 pint rectified spirit.

Dose—½ to 2 drs.; for a child 1 year old 5 minims, on sugar.

In addition to the above preparations, cinnamon enters into Decoct. Hæmatoxyli, Infus. Catechu, and Vin. Opii; 4 compound powders—*i.e.*, catechu, kino, chalk, and cinnamon; and 4 tinctures—*i.e.*, cardamoms, catechu, cinnamon, and lavender.

***COCA** (Coca or Cuca)—Erythroxylaceæ.

The smooth, dried, green, oval, blunt leaves of Erythroxylon Coca, shortly stalked, and with faint tea-like odour.

Tonic, Restorative, and Cardiac Stimulant. (Page 370.)

Dose—½ to 2 drams.

***Extractum Cocæ Liquidum.** 1 in 1.

A brown liquid prepared by exhausting 20 oz. coca leaves with proof spirit, and evaporating resulting tincture to 20 oz.

Dose—½ to 2 drams.

***Cocainæ Hydrochloras** (Hydrochlorate of Cocaine).

$C_{17}H_{21}NO_4$,HCl.

The hydrochlorate of an alkaloid in colourless acicular crystals, obtained from coca leaves by (1) rendering alkaline with

carbonate of sodium an aqueous solution of an acidulated alcoholic extract, (2) adding ether to this, separating and evaporating the liquid, (3) purifying the product by acidulated water, carbonate of sodium and ether, (4) decolorising, (5) neutralising with hydrochloric acid and recrystallising.

A powerful local Anæsthetic. (Page 370.)

Dose—$\frac{1}{5}$ to 1 grain; or a 4 per cent. solution applied locally.

***Lamellæ Cocainæ** (Discs of Cocaine).

Discs of gelatine, with some glycerine, each weighing about $\frac{1}{50}$ gr. and containing $\frac{1}{200}$ gr. hydrochlorate of cocaine.

COCCUS (Cochineal)—Hemiptera.

The greyish-white, wrinkled, oval, dried female insect Coccus Cacti, reared on Opuntia cochinillifera and other opuntia. Used as a rich red, harmless, colouring agent.

IN—Tr. Card. Co., Tr. Cinch. Co., and

Tinctura Cocci. $2\frac{1}{2}$ oz. to 1 pint.

A carmine coloured liquid prepared by *macerating* $2\frac{1}{2}$ oz. cochineal in 1 pint proof spirit. Used for colouring mixtures.

***CODEINA** (Codeine or Codeia). $C_{18}H_{21}NO_3,H_2O$.

An alkaloid in colourless octahedral crystals, obtained from opium by evaporating the ammoniacal liquors from which morphine has been obtained, treating the residue with water, precipitating with caustic potash, and purifying by recrystallising from ether.

Feebly Hypnotic—given in Diabetes.

Dose—$\frac{1}{4}$ to 2 grs., dissolved in $\frac{1}{2}$ oz. water, or in a pill.

COLCHICI CORMUS (Colchicum Corm)—Melanthaceæ.

The *fresh* bulb (about the size of a chestnut) of Colchicum autumnale—meadow saffron, and the same in thin, white, *dried*, kidney-shaped slices. Collected about the end of June.

Diuretic, Purgative, and Cardiac Sedative. Used in gout.

Dose—2 to 8 grs., in powder. (Page 372.)

Extractum Colchici.

A soft, brownish-black extract, prepared by heating the juice of the fresh corm to 212°, straining, and evaporating under 160°.

Dose—$\frac{1}{2}$ to 2 grs., in pill.

Extractum Colchici Aceticum.

A very soft, brownish-black extract, prepared by adding 5 per cent. acetic acid to the bruised corms, pressing out the juice, heating it to 212°, straining, and evaporating under 160°.

Dose—$\frac{1}{2}$ to 2 grs., in pill.

Vinum Colchici. 4 oz. to 1 pint (11 grs. in 1 dram).

A slightly muddy, tea-coloured liquid, prepared by macerating 4 oz. dried colchicum corm in 1 pint sherry.

Dose—10 to 30 minims.

COLCHICI SEMINA (Colchicum Seeds)—Melanthaceæ.

The small, hard, globular, reddish-brown, ripe seeds of Colchicum autumnale, collected about the end of July.

Action like the corm.

Tinctura Colchici Seminum. $2\frac{1}{2}$ oz. to 1 pint.

A brown, sherry-coloured liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. colchicum seeds with 1 pint proof spirit.

Dose—10 to 30 minims.

COLLODIUM (Collodion). 1 in 48.

A colourless syrupy liquid, consisting of a solution of 1 oz. pyroxylin (gun-cotton) in 36 oz. ether and 12 oz. spirit.

Protective to wounds. (Page 373.)

Collodium Flexile (Flexible Collodion).

A colourless syrupy liquid, prepared by dissolving $\frac{1}{2}$ oz. Canada balsam and $\frac{1}{4}$ oz. castor oil in 12 oz. collodion.

Acts like collodion, but less liable to crack on drying.

***Collodium Vesicans** (Blistering Collodion).

A thick liquid, consisting of 1 oz. pyroxylin and 20 oz. blistering liquid.

Vesicant.

COLOCYNTHIDIS PULPA (Colocynth Pulp)—Cucurbitaceæ.

The dried, spongy, light pulp of Citrullus Colocynthis—the bitter apple—in broken white balls, the hard yellow rind and the seeds (resembling apple pips) being rejected.

A Hydragogue Cathartic.

Dose—2 to 8 grs., in pill.

Extractum Colocynthidis Compositum. 1 in $4\frac{1}{2}$ nearly.

A firm, blackish mass, prepared by exhausting 6 oz. colocynth pulp with 1 gallon of proof spirit, and, after the volatile spirit is distilled from the resulting tincture, 12 oz. extract of Socotrine aloes, 4 oz. resin of scammony, 3 oz. curd soap, and 1 oz. cardamoms, all in fine powder, are added, and the evaporation continued till a pilular consistence is reached.

Purgative. Acts like Pil. Colocy. Co. (Page 374.)

Dose—3 to 10 grs., in pill.

Pilula Colocynthidis Composita. 1 in 6.

Prepared by beating together 1 oz. colocynth pulp, 2 oz. Barbadoes aloes, 2 oz. scammony resin, $\frac{1}{4}$ oz. of sulphate of potassium, and 2 drs. oil of cloves, with q.s. distilled water. Distinguished from the extract by the odour of cloves.

Dose—5 to 10 grs.

Pilula Colocynthidis et Hyoscyami. 1 and 3 in 9.

1 oz. extract of hyoscyamus and 2 oz. colocynth pill.

Dose—5 to 10 grs. Not so liable to gripe as Pil. Col. Co.

CONII FOLIA (Hemlock Leaves)—Umbelliferæ.

The finely-divided, smooth, *fresh* leaves and young branches of the Spotted Hemlock, Conium maculatum. Gathered from wild British plants when the fruit begins to form. The stems are smooth and marked with purple spots.

Anodyne. Narcotic. Sedative. (Page 375.)

Dose—2 to 8 grs., in powder or pill.

Cataplasma Conii. 1 in 15.

1 oz. hemlock juice, evaporated to half its bulk, and mixed with 4 oz. linseed meal, and 10 oz. boiling water.

Anodyne.

Extractum Conii.

The green extract prepared by the evaporation of fresh hemlock juice from the leaves and branches, by the same process as described under Extract of Aconite.

Dose—2 to 6 grs. in pill. If combined with an alkali or surrounded by chalk powder, pills with hemlock give out the stinking odour of mice.

Pilula Conii Composita. $2\frac{1}{2}$ in 3.

$2\frac{1}{2}$ oz. extract of hemlock, $\frac{1}{2}$ oz. ipecacuanha, treacle q.s.

Dose—5 to 10 grs., as above.

Succus Conii.

A brownish liquid, consisting of the juice of hemlock leaves to which $\frac{1}{4}$ of rectified spirit is added.

Dose—$\frac{1}{2}$ to 1 dram.

Vapor Coninæ (Inhalation of Conine).

Juice of hemlock $\frac{1}{2}$ oz., liquor potassæ 1 dram, and distilled water 1 oz., mixed. 20 minims poured on a sponge, in a suitable apparatus, and the vapour of hot water passed over it.

CONII FRUCTUS (Hemlock Fruit)—Umbelliferæ.

The small, seed-like, greyish fruit, consisting of separate mericarps, with 5 waved ridges, of Conium Maculatum, gathered when fully developed but while still green, and carefully dried.

Action like the leaves.

Tinctura Conii. $2\frac{1}{2}$ oz. to 1 pint.

A brownish liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. of the finely comminuted fruit with 1 pint of proof spirit.

Dose—20 to 60 minims.

COPAIBA (Copaiva or Copaiba) from Leguminosæ.

The thick, yellow, fluid oleo-resin, obtained from deep incisions in the trunk of Copaifera Langsdorffii or other Copaifera.

Stimulant to urinary and other mucous surfaces. (Page 376.)

Dose—$\frac{1}{2}$ to 1 dram, in emulsion, with 2 drams mucilage or 15 minims liquor potassæ; commonly given in capsules.

Oleum Copaibæ.

The colourless or pale-yellow oil distilled from Copaiva.

Dose—5 to 20 minims, as above.

CORIANDRI FRUCTUS (Coriander Fruit)—Umbelliferæ.

The small, globular, ribbed, yellowish-brown, dried, ripe, seed-like fruit of Coriandrum sativum.

An Aromatic, Stimulating Antispasmodic. (Page 377.)

Dose—10 to 60 grs. in powder.

IN—Confect. Sennæ, Syr. Rhei, Tinct. Rhei, and Tinct. Sennæ.

Oleum Coriandri.

The yellowish oil distilled in Britain from the fruit.

Dose—1 to 4 minims, on sugar or in emulsion.

IN—Syrupus Sennæ.

CREASOTUM (Creasote).

A colourless or pale-yellow oily liquid, a product of the distillation of Wood Tar.

Sedative, Astringent, and Antiseptic. Externally Styptic.

Dose—1 to 3 minims, in pill. (Page 377.)

Mistura Creasoti. 1 minim in 1 oz. (nearly)

A nearly colourless mixture, consisting of creasote and glacial acetic acid 15 minims each, spirit of juniper $\frac{1}{2}$ dram, syrup 1 oz., and distilled water 15 oz.

Dose—1 to 2 oz.

Unguentum Creasoti. 1 in 9.

A yellowish-white or cream-coloured ointment, prepared by mixing 1 dr. creasote and 1 oz. simple ointment.

Vapor Creasoti. 12 minims in 8 oz.

12 minims of creasote mixed in a suitable apparatus with 8 oz. boiling water, so that air can be passed through the mixture and afterwards be inhaled.

CRETA (Chalk). $CaCO_3$.

Native friable carbonate of lime. Used for making CO_2.

CRETA PRÆPARATA (Prepared Chalk). $CaCO_3$.

In little conical masses, or as an almost amorphous white powder, freed from its impurities by elutriation.

Antacid and mildly Astringent. (Pages 378 and 345.)

Dose—10 to 60 grs., in powder or with syrup.

IN—Hydrarg. cum Creta 2 in 3, and in

Mistura Cretæ. $\frac{1}{4}$ oz. to 8 oz.

A white, milky mixture, prepared by rubbing up $\frac{1}{4}$ oz. prepared chalk, $\frac{1}{4}$ oz. powdered gum acacia, $\frac{1}{2}$ oz. syrup, in $7\frac{1}{2}$ oz. cinnamon water.

Dose—1 to 2 oz. For a child 1 year old 1 to 2 drs.

Pulvis Cretæ Aromaticus. 1 in 4 (nearly).

A pale brown powder, consisting of cinnamon, nutmeg, saffron, cloves, cardamoms, sugar, and chalk. 4. 3. 3. $1\frac{1}{2}$. 1. 25. 11.

An Aromatic Astringent.

Dose—10 to 60 grs.

Pulvis Cretæ Aromaticus cum Opio. 1 in 40 of opium.

A pale-brown powder, prepared by mixing $9\frac{3}{4}$ oz. of aromatic powder of chalk with $\frac{1}{4}$ oz. powdered opium.

Aromatic, Astringent, and Narcotic.

Dose—10 to 40 grs.; for a child 1 year old, 1 gr.

CROCUS (Saffron)—Iridaceæ.

The dried thread-like styles, each terminating with three orange stigmas, measuring about 1 inch, of Crocus sativus.

Supposed Emmenagogue; only used for its colour.

IN—Decoct. Aloes Co. Pil. Aloes et Myrrhæ, Pulv. Cretæ Aromat., Tinct. Cinch. Co., Croci, Opii Ammon., and Rhei.

Tinctura Croci. 1 oz. to 1 pint.

A bright yellowish-brown liquid, prepared by macerating and percolating 1 oz. saffron with 1 pint proof spirit.

Dose—$\frac{1}{2}$ to 2 drs.

CROTONIS OLEUM (Croton Oil)—from Euphorbiaceæ.

The viscid, fluorescent, brownish-yellow oil, *expressed* in Britain from the seeds of Croton Tiglium.

A Hydragogue Cathartic, acting generally within one or two hours. (Page 378.)

Dose—$\frac{1}{3}$ to 1 minim, in pill or on dry sugar.

Linimentum Crotonis. 1 in 8.

A green liquid, consisting of croton oil 1 oz., oil of cajuput and rectified spirit, of each $3\frac{1}{2}$ oz.

Rubefacient and Counter-irritant.

CUBEBA (Cubebs)—Piperaceæ.

The globular, dried, unripe fruit of Piper Cubeba (Cubeba officinalis), about the size and colour of black pepper, with a stalk attached to it. (Page 379.)

Stimulant to the genito-urinary and other mucous surfaces.

Dose in gonorrhœa—$\frac{1}{2}$ to 2 drams, in powder, given in milk.

***Oleo-Resina Cubebæ** (Oleo-Resin of Cubebs).

The liquid obtained after exhausting cubebs with ether, and allowing the ether to evaporate, and crystalline matter to deposit.

Dose—5 to 30 minims, in emulsion with mucilage or egg.

Oleum Cubebæ.

A pale greenish-yellow oil, distilled from cubebs in Britain.

Dose—5 to 20 minims, in emulsion with mucilage.

Tinctura Cubebæ. $2\frac{1}{2}$ oz. to 1 pint.

A clear sherry-coloured liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. cubebs with 1 pint *rectified* spirit.

Dose—$\frac{1}{2}$ to 2 drs.

CUPRUM. Cu. Fine Copper Wire, about No. 25 gauge, or about 0·02 of an inch.

Used in preparing Spt. Æther. Nitrosi.

***Cupri Nitras.** $Cu(NO_3)_2,3H_2O$.

Deep blue, prismatic, deliquescent crystals, obtained by dissolving copper in nitric acid and evaporating until crystals form on cooling to 70°.

Astringent and Caustic. (Page 380.)

Cupri Sulphas. $CuSO_4,5H_2O$.

A blue crystalline salt in oblique prisms, obtained by dissolving copper or its black oxide in sulphuric acid, and purifying by recrystallisation.

Astringent, Tonic, Emetic, and Caustic.

Dose—As an Astringent, $\frac{1}{4}$ gr. to 2 grs. in pill; as an Emetic, 5 to 10 grs. in solution in water.

CUSPARIÆ CORTEX (Cusparia Bark)—Rutaceæ.

The straight incurved pieces or quills, bevelled at the edges, with an external corky layer and mottled brown epidermis of Galipea Cusparia. Known also as Angostura Bark.

A Bitter Stimulating Tonic.

Dose—10 to 30 grs., in powder.

Infusum Cuspariæ. ½ oz. to ½ pint (1 hour).

½ oz. Cusparia bark infused in 10 oz. distilled water at 120°.

Dose—1 to 2 oz.

CUSSO (Kousso)—Rosaceæ.

The dried panicles chiefly of the female flowers of Hagenia abyssinica (Brayera anthelmintica) in compressed clusters: the small flowers are reddish-brown, on hairy stalks, with calyx five-parted.

Anthelmintic for *tænia solium*.

Dose—¼ to ½ oz.

Infusum Cusso. ½ oz. to 8 oz. (¼ hour.)

Kousso ½ oz., infused in 8 oz. boiling distilled water.

Dose—4 to 8 oz., without straining.

DIGITALIS FOLIA (Foxglove Leaves)—Scrophulariaceæ.

The large, wrinkled, downy, dried leaves, with bluntly serrated edges, of Digitalis purpurea (Purple Foxglove). From wild British plants of the second year's growth, when about two-thirds of the flowers are expanded.

Diuretic and Cardiac Tonic. (Page 381.)

Dose—½ to 1½ grs., in pill.

Infusum Digitalis. 28 grs. to 10 oz. (¼ hour.)

28 grs. digitalis leaf infused in 10 oz. boiling distilled water.

Dose—2 to 4 drams.

Tinctura Digitalis. 2½ oz. to 1 pint.

A dark-brown liquid, prepared by macerating and percolating 2½ oz. digitalis leaf with 1 pint proof spirit.

Dose—10 to 30 mins. 2 to 4 drs. in Delirium Tremens.

ECBALLII FRUCTUS (Squirting Cucumber Fruit)—Cucurbitaceæ.

The nearly ripe fruit (resembling a small hairy cucumber) of Ecballium Elaterium. Grown in Britain.

ELATERIUM (Elaterium, or Extract of Elaterium).

A sediment in thin, friable, greenish-grey curved cakes, obtained by collecting the deposit which settles down from the juice of the Squirting Cucumber.

A drastic Hydragogue Cathartic. (Page 383.)
Dose—$\frac{1}{10}$ to $\frac{1}{2}$ gr., in powder or pill.

***ELATERINUM** (Elaterin). $C_{20}H_{28}O_5$.

A chemically neutral substance, being the active principle of elaterium, in small, colourless crystals, obtained by exhausting elaterium with chloroform, adding ether, and washing and recrystallising the precipitate.
A drastic Hydragogue Cathartic. (Page 383.)
Dose—$\frac{1}{40}$ to $\frac{1}{10}$ gr.

Pulvis Elaterini Compositus. 1 in 40.

A white powder, consisting of elaterin 5 grs., sugar of milk 195 grs.
Dose—$\frac{1}{2}$ to 5 grs., in pill or powder.
☞ The student should note the difference between Elaterin and Elaterium and their doses.

ELEMI (Manilla Elemi)—Terebinthaceæ or Amyridaceæ.

A concrete resinous exudation in yellowish-white adhesive masses, probably from Canarium commune.
A Stimulating Rubefacient, and used only externally.

Unguentum Elemi. 1 in 5. (Balm of Arcæus.)

A dirty, yellowish-white ointment, prepared by melting together $\frac{1}{4}$ oz. elemi and 1 oz. simple ointment, and straining.

Emplastrum Calefaciens.—(See under Cantharis.)

ERGOTA (Ergot)—Graminaceæ.

Ergot is the spawn of Clavieeps purpurea, produced between the pales and replacing the grain of Secale cereale; in long, dark-purple, cylindrical, brittle grains, pinkish-white internally.
Emmenagogue. Acting on unstriped muscular fibre. (P. 385)
Dose—20 to 30 grs. Seldom, however, given in powder.

Extractum Ergotæ Liquidum. 1 oz. in 1 oz.

A deep, coffee-brown liquid, obtained by exhausting 16 oz. of ergot with 6 pints water, evaporating this to 10 oz., and adding 6 oz. rectified spirit.
Dose—10 to 30 minims, in water.

***Ergotinum** (Ergotin, or Bonjean's Ergotine).

A soft extract, prepared by evaporating the liquid extract of ergot to a syrupy state, adding spirit, filtering, and continuing the evaporation till the consistence of a soft extract is reached.
Dose—2 to 5 grs., in pill.

***Injectio Ergotini Hypodermica.** 1 in 3.

100 grs. ergotin in 200 fluid grains of camphor water.

Dose—By subcutaneous injection, 3 to 10 mins.

Infusum Ergotæ. ½ oz. to 10 oz. (½ hour.)

½ oz. crushed ergot infused in 10 oz. boiling distilled water.

Dose—1 to 2 oz.

Tinctura Ergotæ. 5 oz. to 1 pint.

A coffee-brown liquid, prepared by macerating and percolating 5 oz. ergot with 1 pint proof spirit.

Dose—5 to 30 minims.

ETHER.—(See under Æther.)

***EUCALYPTI OLEUM** (Oil of Eucalyptus)—Myrtaceæ.

The colourless or pale yellow oil distilled from the fresh leaves of Eucalyptus Globulus, E. amygdalina, and other species.

A powerful Antiseptic. (Page 386.)

Dose—1 to 4 minims.

***Unguentum Eucalypti.** 1 in 5.

A yellowish ointment, prepared by melting together oil of eucalyptus, 1 oz., by weight; soft and hard paraffin, of each 2 oz.

FARINA LINI.—(See Lini Farina.)

FARINA TRITICI (Wheaten Flour)—Graminaceæ.

The grain of wheat, Triticum sativum, ground and sifted; used in making Cataplasma Fermenti.

FEL BOVINUM PURIFICATUM (Purified Ox Bile).

A dark-green, soft solid, prepared by evaporating fresh ox bile to ¼ its volume, adding twice its bulk of spirit, filtering, and continuing the evaporation.

Tonic, Aperient, and Antiseptic. (Page 387 and 509.)

Dose—5 to 10 grs., in pill.

FERRUM (Iron)—Fe.

Annealed iron, in the form of wire (No. 35 gauge) or nails, free from oxide. The different preparations of this substance vary in their action. Pure iron, for example, acts simply as a Tonic and Hæmatic, or blood improver, while the acid preparations are generally powerful Astringents as well. Iron forms a dark, discoloured liquid when ordered with any of the

bitter infusions, except those of Quassia and Calumba. The same remark applies to all astringent vegetable tinctures. Iron, like arsenic, should be prescribed to be taken after meals, and well diluted.

***Liquor Ferri Acetatis Fortior.** (40 per cent.)

A deep-red fluid, prepared by dissolving ferric hydrate (formed by precipitating solution of persulphate of iron with ammonia) in glacial acetic acid and water.

Astringent, Tonic, and Diuretic.

Dose—1 to 8 minims, in water.

***Liquor Ferri Acetatis.** 1 in 4.

A red fluid, consisting of strong solution of acetate of iron 5 oz., distilled water up to 20 oz.

Dose—5 to 30 minims.

Tinctura Ferri Acetatis. 5 oz. in 1 pint.

A brown liquid, prepared by mixing 5 oz. strong solution of acetate of iron, 1 oz. acetic acid, 5 oz. rectified spirit, and 9 oz. distilled water.

Dose—5 to 30 minims, in water.

Ferri Arsenias (Arseniates of Iron with some Oxide.)

A green, amorphous powder, prepared by mixing a solution of arseniate and bicarbonate of sodium with one of sulphate of iron, and drying the precipitate at a low temperature.

Resembles arsenic in its action; the amount of iron being so small its chalybeate action is not appreciable.

Dose—$\frac{1}{16}$ to $\frac{1}{2}$ gr., in pill. (See R. on page 113.)

Ferri Carbonas Saccharata. 37 per cent. $FeCO_3, x H_2O$.

Saccharated Carbonate of Iron, consisting of carbonate and peroxide of iron, mixed with sugar. A greyish-brown powder, cohering in little lumps, prepared by mixing solutions of carbonate of ammonium and sulphate of iron, washing the resulting carbonate, rubbing it up with sugar, and drying.

Dose—5 to 30 grs.

Pilula Ferri Carbonatis. 1 in $1\frac{1}{4}$.

1 oz. of saccharated carbonate of iron and $\frac{1}{4}$ oz. confection of roses, beaten well together.

Dose—5 to 20 grs.

Mistura Ferri Composita. $2\frac{1}{2}$ grs. sulphate to 1 oz.

A muddy, green, changeable mixture, prepared by mixing myrrh and sugar, of each 60 grs., carbonate of potassium 30

grs.. spirit of nutmeg ½ oz., rose water 9½ oz., and adding sulphate of iron 25 grs. Commonly called Griffith's Mixture, and contains about 1 gr. carbonate of iron in each oz.

Hæmatic and Emmenagogue. (Page 391.)

Dose—1 to 2 oz.

Mistura Ferri Aromatica. About 1 gr. of iron in 1 pint.

Commonly called *Heberden's Ink*, and contains *tannate* of iron as an inky precipitate. Prepared by macerating 1 oz. red cinchona bark, ½ oz. calumba, ¼ oz. cloves, ½ oz. iron wire, 3 oz. compound tincture of cardamoms, ½ oz. tincture of orange peel, and peppermint water to 16 oz.

Dose—1 to 2 oz.

Ferri et Ammonii Citras.

Citrate of Iron and Ammonium, in transparent ruby scales. Prepared by mixing solutions of persulphate of iron and ammonia, and dissolving the freshly precipitated ferric hydrate thus formed in solution of citric acid, and, after the addition of ammonia, evaporating.

Dose—5 to 10 grs.; a most agreeable tonic in solution.

Vinum Ferri Citratis. 8 grs. in 1 oz.

A brownish liquid, prepared by dissolving 160 grs. of citrate of iron and ammonium in 1 pint orange wine.

Dose—1 to 4 drams.

Ferri et Quininæ Citras. 1 gr. Quinine in 6.

In greenish-yellow scales, being a citrate of Quinine, Iron, and Ammonium. Prepared by dissolving the peroxide of iron (formed as in the last preparation) in citric acid, adding quinine (prepared by precipitating the sulphate by ammonia), neutralising with ammonia, and evaporating.

Hæmatic, Tonic, Antiperiodic. (Page 388.)

Dose—5 to 10 grs., in solution or in pill.

Pilula Ferri Iodidi. 1 in 3½.

Prepared by mixing 40 grs. iron wire, 80 grs. iodine, 50 minims distilled water, and adding 70 grs. sugar and 110 grs. liquorice, and beating all together.

Dose—3 to 8 grs. Should be dispensed in a bottle.

Syrupus Ferri Iodidi. 13 grs. FeI, in 1 dram.

A colourless syrup, prepared by heating 1 oz. iron wire and 2 oz. iodine with 3 oz. distilled water, and adding the filtered product to 28 oz. sugar dissolved in 10 oz. water.

Dose—½ to 1 dram. Flavoured with oil of lemon, it is easily administered to children. Dose for a child 1 year old, 2 mins.

Ferri Peroxidum Hydratum (Peroxide of Iron). Fe_2O_3,H_2O.

A reddish-brown powder, prepared by mixing solutions of soda and persulphate of iron, washing and drying the precipitate at a temperature under 212°.

Dose—5 to 30 grs. in powder.

Emplastrum Ferri. (Chalybeate or Roborans Plaster). 1 in 11.

A solid red plaster, consisting of peroxide of iron 1 oz., Burgundy pitch 2 oz., lead plaster 8 oz.

***Liquor Ferri Dialysatus.** (5 per cent.)

A clear, dark-reddish brown solution of highly basic ferric oxychloride, with the acid mostly removed by dialysis, prepared by adding recently formed ferric hydrate (obtained by mixing strong solutions of the perchloride of iron and ammonia) to strong solution of perchloride of iron, dissolving and placing in a dialyser.

Dose—10 to 30 minims.

Liquor Ferri Perchloridi Fortior. 2 oz. iron in 10.

A deep orange-brown liquid, prepared by boiling iron wire in hydrochloric acid and distilled water, and, after filtering, adding nitric acid and more hydrochloric, and concentrating by evaporation.

A powerful Astringent, Caustic, and Hæmostatic. (P. 388.)

Liquor Ferri Perchloridi. 1 in 4.

A brown liquid, prepared by mixing 5 oz. strong solution of perchloride of iron with 15 oz. distilled water.

Dose—10 to 30 minims, freely diluted.

Tinctura Ferri Perchloridi. 1 in 4.

A brown liquid, prepared by adding 5 oz. strong solution of perchloride of iron to 5 oz. rectified spirit and 10 oz. distilled water.

Dose—10 to 30 minims, freely diluted. (Page 390.)

Liquor Ferri Pernitratis. 1 oz. iron in 30.

A reddish-brown liquid, prepared by dissolving 1 oz. iron wire in 4½ oz. nitric acid and 25½ oz. distilled water.

Dose—10 to 40 minims, freely diluted.

Liquor Ferri Persulphatis. (See under Ferri Sulphas.)

Ferri Phosphas. 47 per cent. Ferrous Phosphate ($Fe_3P_2O_8$, $8H_2O$) with Ferric Phosphate and some Oxide.

A slate-blue amorphous powder, prepared by mixing a solu-

tion of sulphate of iron with one of phosphate and bicarbonate of sodium, and drying the washed precipitate.

Dose—5 to 10 grs., in powder.

Syrupus Ferri Phosphatis. 1 gr. in 1 dr.

A colourless syrup, prepared by dissolving fresh phosphate of iron, made as in last preparation, in concentrated phosphoric acid, sugar, and distilled water.

Dose—1 dram, diluted; in anæmic dyspepsia.

Ferri Sulphas. $FeSO_4,7H_2O$.

Pale greenish-blue crystals, prepared by boiling iron wire in diluted sulphuric acid, and allowing the salt to crystallise.

Tonic, Astringent, and Emmenagogue. (Page 391.)

Dose—1 to 5 grs., in solution.

IN—Pil. Aloes et Ferri, 1 in 7.

Ferri Sulphas Exsiccata. $FeSO_4,H_2O$.

A greyish powder, prepared by heating the last preparation at 212°, and powdering the residue. $2\frac{1}{2}$ grs. = 4 grs. Ferri Sulph.

Dose—$\frac{1}{2}$ to 3 grs., in pill.

Ferri Sulphas Granulata. $FeSO_4,7H_2O$.

In small granular crystals, of a pale greenish-blue, prepared by heating iron wire in diluted sulphuric acid, and filtering the solution into rectified spirit, with constant stirring.

Dose—1 to 5 grs., in solution or in pill.

Liquor Ferri Persulphatis. $Fe_2 3SO_4$. $36\frac{1}{2}$ per cent.

A dense dark red solution of FERRIC sulphate, prepared by dissolving 8 oz. sulphate of iron in 6 drs. sulphuric acid and 10 oz. distilled water, and adding 6 drs. nitric acid in 2 oz. distilled water, and making up to 11 oz. after converting all the sulphate into persulphate by boiling.

Styptic; introduced for the purpose of making 5 preparations of iron.

Vinum Ferri. 1 oz. to 1 pint.

A brownish-green liquid, prepared by *partially immersing* 1 oz. iron wire in 1 pint of sherry for a month.

Dose—1 to 4 drams; contains a small amount of iron, chiefly as tartrates, malates, and citrates.

Ferrum Redactum (Reduced Iron). Fe and Fe_3O_4.

A black powder, consisting of metallic iron and a variable amount of oxide, prepared by passing dry Hydrogen over red-hot hydrated peroxide of iron in an iron tube.

Tonic, Hæmatic ; sometimes called Quevenne's iron.
Dose—1 to 5 grs., in pill. (Page 391.)

Trochisci Ferri Redacti. 1 gr. in each.

Greyish-black lozenges, consisting of reduced iron 720 grs., sugar 25 oz., gum acacia 1 oz., mucilage of gum acacia 2 oz., distilled water q.s., divided into 720 lozenges.
Dose—1 to 6.

Ferrum Tartaratum (Tartarated Iron or Tartrate of Iron and Potassium). $KFeOC_4H_4O_6$.

In deep garnet scales, prepared by dissolving freshly-precipitated peroxide of iron (deposited from the persulphate solution by ammonia) in solution of cream of tartar, and evaporating carefully.
Dose—5 to 10 grs., in solution of water. (Page 389.)

☞ The double salts of iron with potassium, quinine, and ammonium, are known as the *scale* preparations of iron from their physical characteristics.

FICUS (Fig)—Urticaceæ.

The dried fruit of the common Fig tree—Ficus Carica.
Laxative ; used in making Confectio Sennæ.

FILIX MAS (Male Fern)—Filices.

The tufted, scaly, greenish-brown rhizome, with persistent bases of the foot-stalks and root-fibres of Aspidium Filix-mas. Collected late in the Autumn, and divested of scales, roots, and dead matter, and carefully dried. Should not be used if more than 1 year old.

Extractum Filicis Liquidum.

A thick, dark-green, oily liquid, prepared by extracting the oleo-resinous matter from the male fern by percolating it with ether, and evaporating the ethereal tincture.
Anthelmintic ; used to destroy the tapeworm. (Page 392.)
Dose—15 to 30 minims, in emulsion. (Page 36.)

FŒNICULI FRUCTUS (Fennel Fruit)—Umbelliferæ.

The pale-brown, oblong, ribbed, seed-like, beaked fruit of cultivated plants of Fœniculum Capillaceum (F. Vulgare).
Carminative, Antispasmodic, and Galactagogue. (Page 392.)
In—Pulv. Glycyrrhizæ Co.

Aqua Fœniculi. 1 lb. to 1 gallon.

A colourless water, obtained by distilling 1 gallon, from 2 gallons of water, and 1 pound fennel fruit.
Dose—1 to 3 oz. For a child 1 year old, one dram.

GALBANUM (Galbanum)—Umbelliferæ.

A fetid, greenish-yellow gum-resin, in small tears agglutinated into masses, derived from Ferula galbaniflua and F.

rubricaulis, and probably other species.

An Antispasmodic and stimulating Expectorant. (Page 392.)

Dose—2 to 5 grs., in pill, but seldom given.

Emplastrum Galbani. 1 in 11.

A yellow solid, consisting of galbanum, ammoniaeum, and yellow wax, of each 1 oz., and lead plaster 8 oz.

Galbanum enters into Pil. Asafœtidæ Co.

GALLA (Galls)—From Cupuliferæ.

A partially insect and partially vegetable production, growing as a round, hard, tuberculated tumour or excrescence on the oak (Quercus infectoria), and caused by the irritation arising from the punctures made by Cynips Gallæ tinctoriæ, an insect which deposits its ova in the young buds.

Astringent. Generally given in the form of tannin. (P. 304.)

Tinctura Gallæ. $2\frac{1}{2}$ oz. to 1 pint.

A dark-brown liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. galls (in No. 40 powder) with 1 pint proof spirit.

Dose—$\frac{1}{2}$ to 2 drams.

Unguentum Gallæ. 80 grs. to 1 oz.

A pale brown ointment, prepared by rubbing 80 grs. powdered galls with 1 oz. benzoated lard.

Astringent. Chiefly used for hæmorrhoids.

Unguentum Gallæ cum Opio. 32 grs. to 1 oz.

A light brown ointment, prepared by mixing 32 grs. powdered opium with 1 oz. ointment of galls.

A Local Anodyne and Astringent application to painful hæmorrhoids.

Gallic and Tannic Acids. (See under Acidum.)

***GELSEMIUM** (Yellow Jasmine)—Loganiaceæ.

The dried yellowish-brown cylindrical rhizome marked with longitudinal purple lines and small attached rootlets of Gelsemium nitidum (G. sempervirens).

Sedative. Used for Neuralgia of 5th nerve. (Page 392.)

Dose—5 to 30 grs.

***Extractum Gelsemii Alcoholicum.**

A semi-solid extract, prepared by exhausting gelsemium with spirit and water, and evaporating the tincture.

Dose—$\frac{1}{2}$ to 2 grs., in pill.

***Tinctura Gelsemii.** $2\frac{1}{2}$ oz. to 1 pint.

$2\frac{1}{2}$ oz. gelsemium in No. 40 powder, macerated and percolated with 1 pint proof spirit.

Dose—5 to 20 minims.

GENTIANÆ RADIX (Gentian Root)—Gentianaceæ.

The tough, wrinkled, or ringed brownish-yellow, dried root of Gentiana lutea, in cylindrical pieces or longitudinal slices.

A pure, Bitter Tonic, without astringency. (Page 393.)

Dose—10 to 30 grs., in powder.

☞ This root is often confounded with Belladonna and Pyrethrum. From the former it is distinguished by its brownish-yellow colour, and by the close, transverse markings, which give it a ringed appearance. It differs from pyrethrum in its toughness, and in the absence of the black, shining points seen in the thick, brittle bark. Gentian is bitter, while pyrethrum causes a prickling sensation in the mouth.

Extractum Gentianæ.

A brownish-black, soft extract, prepared by infusing and afterwards boiling the root in water and evaporating.

Dose—2 to 10 grs. A harmless excipient for pill masses.

Infusum Gentianæ Compositum. 55 grs. to ½ pint (½ hour).

55 grs. each gentian root and bitter-orange peel, and ¼ oz. fresh lemon peel, infused in 10 oz. boiling water.

Dose—1 to 2 oz.

Tinctura Gentianæ Composita. 1½ oz. to 1 pint.

A golden-brown liquid, prepared by macerating and percolating with 1 pint proof spirit 1½ oz. gentian, ¾ oz. bitter-orange peel, and ¼ oz. cardamom seeds.

Dose—½ to 2 drs.

GLYCERINUM (Glycerine). $C_3H_5(HO)_3$.

A colourless, oily-looking, thick fluid, obtained from fats and fixed oils, and containing a small percentage of water.

Demulcent, Nutrient, Antiseptic, and Emollient. (P. 394.)

Dose—1 to 2 drs.

In addition to entering into the 8 Glycerines, it enters into Lin. Iodi, and Lin. Pot. Iod. cum Sapone, Ext. Cinchonæ Liq., Mel Boracis, Pil. Aloes et Myrrh., Rhei Co. and Saponis Co., Tinct. Kino, Ungt. Iodi, and the Lamellæ.

Glycerinum Acidi Carbolici, &c. (See under Acidum Carbolic, &c.; or the table upon page 140.)

GLYCYRRHIZÆ RADIX (Liquorice Root)—Leguminosæ.

The pale-yellow, tough, fibrous root or underground stem or stolon, in long cylindrical, branched pieces, *fresh and dried*, of Glycyrrhiza glabra. (Page 395.)

Demulcent; but chiefly used for its sweetening properties.

☞ This root is distinguished from others by its *yellow* and *fibrous* interior, and by its very sweet taste.

Extractum Glycyrrhizæ.

A firm, black extract, prepared by maceration of the root in cold distilled water, and subsequent evaporation.

Chiefly used for making powders into pills.

Dose—5 grs. to 1 dram.

IN—Confec. Sennæ, Dec. Aloes Co., Tinct. Aloes, and Troch. Opii.

Extractum Glycyrrhizæ Liquidum. 1 in 2 of Extract.

A dark liquid, prepared by evaporating a cold infusion of the root till the specific gravity of 1·16 is reached, and then adding $\frac{1}{6}$ its volume of rectified spirit.

Dose—1 dram.

IN—Mist. Sennæ Co. and Tr. Chloroform. et Morph.

Pulvis Glycyrrhizæ Compositus. 1 in 6.

A greenish powder, consisting of senna and liquorice, of each 2 oz., fennel and sulphur, of each 1 oz., sugar 6 oz.

Dose—30 to 60 grs.

In addition to the above, liquorice root enters into Confect. Terebinth., Dec. Sarsæ Co., Infus. Lini., Pil. Hydrarg., and Pil. Ferri Iod.

GOSSYPIUM (Cotton Wool)—Malvaceæ.

White, soft filaments or hairs of the seed of Gossypium barbadense, and other species of gossypium; with fatty matter and impurities removed.

Used for its mechanical qualities in padding splints and covering burned surfaces, but introduced into the Pharmacopœia for making Pyroxylin.

GRANATI RADICIS CORTEX (Pomegranate Root Bark)—Myrtaceæ.

The greyish-yellow quills or fragments of the dried bark of the root of Punica Granatum—outer surface wrinkled, inner smooth.

Anthelmintic; used to destroy the tapeworm. (Page 395.)

Decoctum Granati Radicis. 2 oz. to 1 pint.

Prepared by taking 2 oz. of the bark of the root of the pomegranate and 2 pints of water, and boiling down to 1 pint.

Dose—2 to 4 oz. every four hours. It causes purging.

GUAIACI LIGNUM (Guaiacum Wood)—Zygophyllaceæ.

The raspings or small chips, of a yellow or dark greenish colour, of the heart wood of Guaiacum officinale, known as Lignum Vitæ.

Diaphoretic and Alterative. (Page 395.)

IN—Decoct. Sarsæ Co.

GUAIACI RESINA (Guaiacum Resin).

The resin from the stem of Guaiacum officinale, or G. sanctum, in large greenish-brown masses or oval tears, obtained by exudation, incision, or by heat.

Diaphoretic and Antisyphilitic.
Dose—10 to 30 grs., in milk or sherry.

Mistura Guaiaci. 11 grs. in 1 oz.

An emulsion, prepared by rubbing $\frac{1}{2}$ oz. of guaiacum resin, $\frac{1}{2}$ oz. sugar, $\frac{1}{4}$ oz. gum acacia, with 1 pint cinnamon water.
Dose—$\frac{1}{2}$ to 2 oz.

Tinctura Guaiaci Ammoniata. 4 oz. to 1 pint.

A dark-brown liquid, prepared by macerating 4 oz. of guaiacum resin in 1 pint aromatic spirit of ammonia for 7 days.
A Stimulant and Diaphoretic.
Dose—$\frac{1}{2}$ to 1 dram, freely diluted.
In addition to the above, the resin enters into Pil. Hydrarg. Subchlor. Co.

GUTTA PERCHA—(Sapotaceæ).

The concrete juice, in tough, light-brown, flexible pieces, of Dichopsis Gutta (Isonandra Gutta) and other sapotaceous trees.

Liquor Gutta Percha. 1 in 8.

A nearly colourless thick fluid, prepared by dissolving 1 oz. gutta percha in 6 oz. chloroform, and adding 1 oz. carbonate of lead mixed with 2 oz. more chloroform, and decanting.
A good substitute for flexible collodion. (Page 396.)
It forms the basis of Charta Sinapis.

HÆMATOXYLI LIGNUM (Logwood)—Leguminosæ.

The dark-red logs or iridescent chips or raspings of the heart-wood of Hæmatoxylon campechianum.
A pure Astringent. (Page 396.)
Dose—10 to 30 grains in powder.

Decoctum Hæmatoxyli. 1 oz. to 1 pint.

Prepared by boiling 1 oz. logwood in 1 pint distilled water for 10 minutes, adding 55 grs. cinnamon near the end of the process, and making the strained product to measure 1 pint.
Dose—1 to 2 oz.

Extractum Hæmatoxyli.

A brittle, deep-red, *solid*, prepared by boiling down an infusion of logwood to dryness.
Dose—10 to 30 grs., dissolved in water.

HEMIDESMI RADIX (Hemidesmus) — Asclepiadaceæ. (Indian Sarsaparilla).

The brownish, cylindrical, tortuous, dried root of Hemidesmus indicus, marked with annular cracks.
Supposed to possess the properties of sarsaparilla. (P. 397.)

Syrupus Hemidesmi. 1 in 8 (by measure).

A deep-brown syrup, prepared by dissolving 28 oz. sugar in an infusion of 4 oz. hemidesmus root in 1 pint boiling water.

Dose—1 dr. Used as a pleasant addition to cough mixtures.

HIRUDO (the Leech).—Class Annelida.

Two leeches are official—the Hamburgh or green leech (Sanguisuga officinalis) and the speckled or English leech (S. medicinalis), the former having a dark-olive and the latter a greenish-yellow spotted belly. *Both* species have six rusty-red longitudinal stripes on the back, which distinguish them from the horse-leech and others. (Page 397.)

HORDEUM DECORTICATUM.—Graminaceæ.

Pearl Barley—The white, rounded, husked seeds of Hordeum distichon. Cultivated in Britain.

Demulcent and Nutrient. (Page 398.)

Decoctum Hordei (Barley Water). 1 in 10.

Prepared by boiling 2 oz. washed pearl barley for twenty minutes in 1½ pint of water. Product about 1 pint.

Dose—1 to 4 oz. or ad libitum.

HYDRARGYRUM (Mercury). **Hg.**

A lustrous fluid metal, 13½ times heavier than water.

Formerly used in the metallic state as a mechanical purgative in large doses. Its various preparations act very differently, but all produce the constitutional debilitating condition known as "Mercurialism," when taken for any length of time. (See Page 398—403.)

Hydrargyrum cum Creta. 1 in 3.

A greyish-blue powder, commonly called "grey powder," prepared by rubbing 1 oz. mercury with 2 oz. prepared chalk.

Alterative and Laxative.

Dose—3 to 8 grs. For a child 1 year old, ¾ to 1½ grs.

Emplastrum Hydrargyri. 1 in 3.

A bluish solid, prepared by rubbing 3 oz. mercury with 56 grs. olive oil and 8 grs. of sulphur, and adding 6 oz. melted lead plaster (the sulphur aiding the division of the mercury).

Resolvent. This preparation sometimes affects the system through the absorption of the metal.

Emplastrum Ammoniaci cum Hydrargyro. 1 in 5 of Hg.

A dirty-blue coloured solid, composed of 3 oz. mercury, 12 oz. ammoniacum, 56 grs. olive oil, and 8 grs. sulphur.

Discutient and Stimulant.

Linimentum Hydrargyri. 1 in 3 of Ungt., 1 in 6 of Hg.

A thick, lead-coloured liquid, composed of mercurial ointment, solution of ammonia, and camphor liniment, of each 1 oz.

A Stimulant to chronic enlargements.

Pilula Hydrargyri. 1 in 3.

"Blue Pill," prepared by rubbing 2 oz. mercury and 3 oz. confection of roses, and adding 1 oz. liquorice in fine powder.

Dose—3 to 8 grs.

Suppositoria Hydrargyri. 5 grs. ointment in each.

Prepared by melting together ointment of mercury 60 grs., oil of theobroma 120 grs., and pouring into 12 conical moulds.

Unguentum Hydrargyri. 1 in 2.

A blue ointment, prepared by rubbing together 1 lb. of mercury, 1 lb. of lard, and 1 oz. suet.

Used to introduce mercury into the system through the skin.

☞ There are 8 ointments bearing the name of mercury. (See page 159.)

Unguentum Hydrargyri Compositum. 1 of Hg. in $4\frac{1}{2}$.

A bluish ointment, consisting of ointment of mercury 6 oz., yellow wax and olive oil, of each 3 oz., camphor $1\frac{1}{2}$ oz.

This is a substitute for Scott's ointment.

Hydrargyri Iodidum Rubrum. HgI_2.

A crystalline vermilion powder, precipitated on mixing hot solutions of perchloride of mercury and iodide of potassium.

A powerful Irritant and Vesicant. Seldom given internally.

Dose—$\frac{1}{12}$ to $\frac{1}{8}$ gr., in pill; sometimes given by prescribing the perchloride with Iodide of Potassium, in *solution*.

Unguentum Hydrargyri Iodidi Rubri. 16 grs. to 1 oz.

A brilliant red ointment, prepared by mixing 16 grs. of red iodide of mercury with 1 oz. simple ointment.

Absorbent and Discutient to glandular growths.

Liq. Arsenii et Hydrargyri Iodidi.

Donovan's Solution. (See Acid. Arsenios.) (Page 165.)

Liquor Hydrargyri Nitratis Acidus. 48 per cent.

A colourless solution of 4 oz. mercury in 5 oz. nitric acid and $1\frac{1}{2}$ oz. distilled water.

Caustic; not used internally.

Unguentum Hydrargyri Nitratis. 1 in 16 nearly.

Called, from its colour, citrine ointment; prepared by adding a solution of 4 oz. mercury in 12 oz. nitric acid to a hot mix-

ture of 15 oz. lard and 32 oz. olive oil.
A local Alterative, Astringent, and Stimulant.

Unguentum Hydrargyri Nitratis Dilutum. 1 in 3.
1 oz. nitrate of mercury ointment and 2 oz. soft paraffin.

***Oleatum Hydrargyri** (Oleate of Mercury).
A light brown oleaginous semi-solid, prepared by triturating 1 oz. yellow oxide of mercury with 9 oz. oleic acid.
Action same as Ungt. Hydrarg.

Hydrargyri Oxidum Flavum. HgO.
A yellow powder, prepared by mixing solutions of perchloride of mercury and soda, washing and drying the precipitate.
Used in Ophthalmia of the eyelids (6 grs. to 1 oz. lard).
It has the same composition as the following, only it exists in a state of more minute division; it is used in making Hydrarg. Oleatum :—

Hydrargyri Oxidum Rubrum. HgO.
Known as "Red Precipitate." An orange-red powder, prepared by heating dry mercuric nitrate (obtained by evaporating a solution of mercury in nitric acid) with metallic mercury.
Dose—$\frac{1}{4}$ to $\frac{3}{4}$ gr., in pill; seldom given internally.

Unguentum Hydrargyri Oxidi Rubri. 62 grs. to 1 oz.
A red ointment, composed of red oxide of mercury 62 grs., hard paraffin $\frac{1}{4}$ oz., and soft paraffin $\frac{3}{4}$ oz.
A local Stimulating Absorbent.

Hydrargyri Perchloridum. $HgCl_2$. (Perchloride of Mercury, Mercuric Chloride, Bichloride of Mercury, or Corrosive Sublimate.)
In heavy colourless masses of prismatic crystals, prepared by subliming a mixture of persulphate of mercury, chloride of sodium, and black oxide of manganese.
Alterative. In even small quantity an irritant poison.
Dose—$\frac{1}{10}$ to $\frac{1}{8}$ gr.
As this salt is decomposed by so many substances, it is advisable to order it in plain solution or in Dec. Sarsæ Co., or in solution with iodide of potassium. (See R. on Page 402.)

Liquor Hydrargyri Perchloridi. $\frac{1}{2}$ gr. in 1 oz.
A colourless solution of 10 grs. corrosive sublimate and 10 grs. sal ammoniac in 1 pint distilled water.
Dose—$\frac{1}{2}$ to 2 drams, diluted. Each dram contains $\frac{1}{16}$ gr.

Lotio Hydrargyri Flava. 18 grs. to 10 oz.

"Yellow Wash." Prepared by adding 18 grs. corrosive sublimate to 10 oz. lime water (the yellow oxide—HgO—falls as a precipitate).

Resembles the yellow and red oxides in action.

Hydrargyri Subchloridum. Subchloride of Mercury. **HgCl.**

Chloride of mercury, calomel, or mercurous chloride—a dull-white heavy powder, prepared by subliming mercurous sulphate (obtained by rubbing mercuric sulphate and mercury together) with dried chloride of sodium, and washing the sublimate in boiling water.

Alterative, Purgative, and in large doses Sedative.

Dose—$\frac{1}{2}$ to 5 grs., in pill or powder. A child 1 year old may get as much as 1 grain with safety.

Lotio Hydrargyri Nigra. 3 grs to 1 oz.

"Black Wash." Prepared by adding 30 grs. calomel to 10 oz. lime water, the black precipitate formed being Hg_2O.

A Stimulating Alterative to syphilitic sores.

Pilula Hydrargyri Subchloridi Composita. 1 in 5.

An orange mass, prepared by beating together 1 oz. calomel, 1 oz. sulphurated antimony, 2 oz. guaiacum resin, and 1 oz. castor oil. Known as Plummer's or Compound Calomel Pill.

Dose—5 to 10 grs., as an Alterative and feeble Cathartic.

Unguentum Hydrargyri Subchloridi. 80 grs. to 1 oz.

A yellowish-white ointment, prepared by mixing 80 grs. subchloride of mercury (calomel) and 1 oz. benzoated lard.

Alterative and Resolvent, but seldom used.

Hydrargyri Persulphas. $HgSO_4$.

A white, heavy, crystalline powder, prepared by heating 20 oz., by weight, of mercury with 12 oz. sulphuric acid. Used for making calomel and corrosive sublimate.

Hydrargyrum Ammoniatum. NH_2HgCl.

Ammoniated mercury or white precipitate; a white powder, prepared by mixing solutions of perchloride of mercury and ammonia, and washing the precipitate.

Used as an Insecticide, and never taken internally.

Unguentum Hydrargyri Ammoniati. 1 to 9.

A white ointment, prepared by mixing 50 grs. ammoniated mercury and 450 grs. simple ointment.

A stimulant in chronic skin diseases, and to destroy pediculi.

HYOSCYAMI FOLIA (Hyoscyamus Leaves)—Solanaceæ.

The sinuated, hairy, *dried* leaves of Hyoscyamus niger (Henbane), also the *fresh* clammy leaves, with their branches —gathered from *biennial* wild or cultivated British plants when two-thirds of the flowers are expanded.

Narcotic, Anodyne, and Sedative. (Page 103.)

Extractum Hyoscyami.

A dark soft mass, prepared by the evaporation of the juice of the fresh leaves and branches of hyoscyamus, by a process identical with that used for making the Extract of Aconite.

Dose—5 to 10 grs.

Pil. Colocynthidis et Hyoscyami. (See Coloeynth.)

Succus Hyoscyami.

The juice of the fresh leaves and young branches of biennial plants, to which $\frac{1}{3}$ of its volume rectified spirit is added.

Dose—$\frac{1}{2}$ to 1 dram.

Tinctura Hyoscyami. $2\frac{1}{2}$ oz. to 1 pint.

A greenish-brown liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. hyoscyamus leaves with 1 pint proof spirit.

Dose—$\frac{1}{2}$ to 1 dram.

***IODOFORMUM.** Iodoform. CHI_3.

Shining lemon-yellow crystalline scales, produced by the action of iodine on a mixture of alcohol and solution of carbonate of potassium.

Antiseptic, Alterative, and Expectorant. (Page 104.)

Dose—$\frac{1}{2}$ to 3 grs., in pill.

***Suppositoria Iodoformi.** 3 grs. in each.

Iodoform 36 grs., oil of theobroma 144 grs., divided into 12.

***Unguentum Iodoformi.** 1 in 10.

Iodoform 1 oz., benzoated lard 9 oz., melted.

Disinfectant, Antiseptic, and Antisyphilitic.

IODUM (Iodine). I.

A non-metallic element, in dark, lustrous, laminar crystals, obtained from the ashes of sea-weeds, and from mineral iodides.

A Lymphatic Stimulant, Absorbent and Alterative. (P. 105.)

Dose—$\frac{1}{2}$ gr., but should *never* be given in this form.

Starch and free ammonia should not be ordered with preparations of iodine.

Linimentum Iodi. 1 dr. to 1 oz.

A dark, reddish-brown liquid, prepared by dissolving iodine $2\frac{1}{2}$ oz., iodide of potassium 1 oz., glycerine $\frac{1}{2}$ oz., in rectified spirit 1 pint. 5 times the strength of the Tincture.

Absorbent and Counter-irritant.

Liquor Iodi. 22 grs. in 1 oz.

A brownish-red liquid, prepared by dissolving iodine 22 grs., and iodide of potassium 33 grs., in distilled water to 1 oz.

Acts like the liniment, only weaker.

Tinctura Iodi. 11 grs. to 1 oz.

A deep-red liquid, prepared by dissolving iodine $\frac{1}{2}$ oz., iodide of potassium $\frac{1}{2}$ oz., in rectified spirit 1 pint.

Dose—5 to 20 minims, diluted; used in making Vapor Iodi.

Unguentum Iodi. 1 in 31, or 14 grs. in 1 oz.

A brown ointment, prepared by rubbing iodine 16 grs., iodide of potassium 16 grs., with glycerine $\frac{1}{2}$ dr., and lard 1 oz.

Resolvent, Alterative, and Irritant.

Vapor Iodi. 1 dr. tincture to 1 oz. water.

Mixed in a suitable apparatus, and heat applied, so that the vapour may be inhaled.

Laryngeal Sedative.

Iodides of Sodium, Arsenic, Iron, Mercury, Potassium, Sulphur, and Lead and their preparations are given under the name of each metal.

IPECACUANHA (or Hippo)—Cinchonaceæ or Rubiaceæ.

The dried root of Cephaelis Ipecacuanha, in small annular, contorted, brown, worm-like pieces. Powder pale fawn colour.

Dose—$\frac{1}{2}$ to 2 grs. act as an Expectorant, 10 grs. as an Hepatic Stimulant, and 15 to 30 as an Emetic. For a child 1 year old, as an Expectorant, $\frac{1}{12}$ to $\frac{1}{4}$ gr.; as an Emetic, 2 to 4 grs. (P. 408.)

In addition to the following, Ipecacuanha enters into Pil. Conii Co.

Pilula Ipecacuanhæ cum Scilla. 1 in 23.

Composed of compound powder of ipecacuanha 3 oz. squill and ammoniacum, of each 1 oz., treacle q.s., beaten into a mass.

Expectorant, Diaphoretic, and Diuretic.

Dose—5 to 10 grs.

Pulvis Ipecacuanhæ Compositus. 1 in 10.

A fawn-coloured powder, composed of opium $\frac{1}{2}$ oz., ipecacuanha $\frac{1}{2}$ oz., sulphate of potassium 4 oz. (Dover's powder.)

Diaphoretic, Anodyne, Narcotic.

Dose—5 to 15 grs.

Trochisci Ipecacuanhæ. $\frac{1}{4}$ gr. in each.

Ipecacuanha 180 grs., sugar 25 oz., gum acacia 1 oz., mucilage 2 oz., water q.s., in 720 fawn-coloured lozenges.

Dose—1 to 3 lozenges as an expectorant.

Trochisci Morphinæ et Ipecacuanhæ. $\frac{1}{36}$ and $\frac{1}{12}$ gr.

Hydrochlorate of morphine 20 grs., ipecacuanha 60 grs., tincture of tolu $\frac{1}{2}$ oz., sugar 24 oz., water $\frac{1}{2}$ oz., gum acacia 1 oz., mucilage q.s., in 720 white-coloured lozenges.

Action similar to Dover's powder.

Dose—1 to 6 lozenges.

Vinum Ipecacuanhæ. 1 oz. to 1 pint (22 grs. in 1 oz).

A brownish liquid, prepared by macerating 1 oz. ipecacuanha in 1 oz. acetic acid, and percolating with 1 pint distilled water, evaporating the resulting liquid to dryness, and macerating the residue in 1 pint sherry.

Dose—5 to 40 mins. as an Expectorant. 3 to 6 drs. as an Emetic.

***JABORANDI** (Jaborandi)—Rutaceæ.

The dried, shortly-stalked, coriaceous, oblong leaflets of Pilocarpus pennatifolius, 4 or more inches in length.

Sialagogue, Diuretic, Diaphoretic, and Expectorant. (P. 410.)

Dose—5 to 60 grs., in powder, or $\frac{1}{20}$ to $\frac{1}{2}$ gr. Pilocarpine.

***Extractum Jaborandi.**

A soft extract, prepared by exhausting jaborandi with proof spirit and water, and evaporating the resulting tincture.

Dose—2 to 10 grs.

***Infusum Jaborandi.** $\frac{1}{2}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

$\frac{1}{2}$ oz. jaborandi (cut small) infused in 10 oz. boiling water.

Dose—1 to 2 oz.

***Tinctura Jaborandi.** 5 oz. to 1 pint.

Prepared by macerating and percolating 5 oz. jaborandi, in No. 40 powder, with 1 pint proof spirit.

Dose—$\frac{1}{2}$ to 1 dram.

JALAPA (Jalap)—Convolvulaceæ.

The dried tuberous root, in brown, wrinkled, dense, ovoid pieces, from a pigeon's to a turkey's egg in size, of Ipomœa Purga (Exogonium Purga). (Page 412.)

A brisk Hydragogue Cathartic.

Dose—10 to 30 grs. 1 to 2 grs. for a child 1 year old.

Extractum Jalapæ. 1 from 2.

A dark-brown extract, obtained by evaporating a strong tincture of jalap root, and also by evaporating a cold infusion made from the marc of the tincture, mixing the two extracts thus obtained, and continuing the evaporation.

Dose—5 to 15 grs., in pill.

Pulvis Jalapæ Compositus. 1 in 3.

A powder closely resembling Dover's in appearance, composed of jalap 5 oz., cream of tartar 9 oz., and ginger 1 oz.

A Hydragogue Cathartic.

Dose—20 to 60 grs.

Tinctura Jalapæ. 2½ oz. to 1 pint.

A deep-brown liquid, prepared by macerating and percolating 2½ oz. jalap, in No. 40 powder, with 1 pint proof spirit.

Dose—½ to 2 drams.

In addition to the above, Jalap enters into Pulv. Scammonii Co.

Jalapæ Resina.

A dark-brown, shining solid, in opaque, brittle fragments, prepared by exhausting jalap with spirit, evaporating and precipitating the resin from the resulting concentrated tincture by adding water, washing and drying on a water-bath.

Resembles jalap in its action, only much more powerful.

Dose—2 to 5 grs., in pill or powder.

IN—Pil. Scammonii Co.

JUNIPERI OLEUM (Oil of Juniper)—From Coniferæ.

The colourless or pale yellow oil distilled in Britain from the full-grown, unripe green fruit of Juniperus communis.

A Stimulating Diuretic and Carminative. (Page 412.)

Dose—1 to 4 minims, on sugar or in pill.

Spiritus Juniperi. 1 in 50.

Oil of juniper 1 oz. and rectified spirit 49 oz.

Dose—½ to 1 dram.

IN—Mistura Creasoti.

KAMALA (Kamala)—From Euphorbiaceæ.

A granular, red, sand-like powder, consisting of the minute glands and hairs that cover the capsules of Mallotus philippinensis (Rottlera tinctoria). (Page 412.)

Cathartic and Anthelmintic. Used to kill *tænia solium*.

Dose—½ to 2 drams, swallowed in milk or gruel.

KINO (Kino)—From Leguminosæ.

The inspissated juice, in small, angular, glistening, dark-red

fragments, from incisions in the trunk of Pterocarpus Marsupium.

Astringent (contains 70 to 80 per cent. of tannin). (P. 412.)

Dose—10 to 30 grs.

Preparations of Kino should not be ordered with iron.

In addition to the following, Kino enters into Pulv. Catechu Co.

Pulvis Kino Compositus. 3 in 4.

A dark-red powder, composed of kino $3\frac{3}{4}$ oz., opium $\frac{1}{4}$ oz., cinnamon 1 oz.

Astringent, Anodyne, and Narcotic.

Dose—5 to 20 grs.

Tinctura Kino. 2 oz. to 1 pint.

A reddish-brown liquid, prepared by macerating kino 2 oz., in glycerine 3 oz., distilled water 5 oz., rectified spirit 12 oz.

Dose—$\frac{1}{2}$ to 2 drams

Kousso (see Cusso)—Rosaceæ.

KRAMERIÆ RADIX (Rhatany Root)—Polygalaceæ.

The dried root of (1) Peruvian Rhatany—Krameria triandra; or of (2) Savanilla Rhatany—K. Ixina (K. Tomentosa). The first is in thick pieces, covered with reddish-brown scaly bark; the second is in smaller and less knotty pieces of violet or purplish colour, and inseparable bark.

Astringent and Tonic. (Contains much tannin). (Page 413.)

Dose— 10 to 30 grs. It should not be ordered with iron.

In addition to the following, Rhatany enters into Pulv. Catechu Co.

Extractum Krameriæ.

A deep reddish-brown, *solid* extract, obtained by exhausting rhatany root with water, and evaporating the liquid to *dryness*.

Dose—5 to 20 grs., in pill, or rubbed up with chalk mixture.

Infusum Krameriæ. $\frac{1}{2}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

Prepared by infusing rhatany root $\frac{1}{2}$ oz. in boiling water 10 oz.

Dose—1 to 2 oz.

Tinctura Krameriæ. $2\frac{1}{2}$ oz. to 1 pint.

A deep-red liquid, prepared by macerating and percolating rhatany root in No. 40 powder $2\frac{1}{2}$ oz., with proof spirit 1 pint.

Dose—$\frac{1}{2}$ to 2 drams.

LAC (the fresh milk of the cow, Bos Taurus).

Used in making Mistura Scammonii.

LACTUCA (Lettuce)—Compositæ.

The flowering herb of Lactuca virosa.

Extractum Lactucæ.

A dark extract, prepared by evaporating the juice of the fresh herb (as in the case of Extract of Aconite).

Diuretic, Sedative, feebly Anodyne, and Narcotic. (P. 413.)

Dose—5 to 15 grs., in pill.

LARICIS CORTEX (Larch Bark)—Coniferæ.

The bark, in red quills or flat pieces, of Pinus Larix (Abies Larix), collected in spring, deprived of its outer rough portion, and dried. (Page 413.)

A Stimulating Astringent. (Checks profuse expectoration.)

Tinctura Laricis. 2½ oz. to 1 pint.

A dark-red liquid, prepared by macerating and percolating larch bark 2½ oz., in No. 40 powder, with rectified spirit 1 pint.

Dose—20 to 30 minims.

LAUROCERASI FOLIA (Cherry-Laurel Leaves)–Rosaceæ

The elliptical, smooth, shining, deep-green, *fresh* leaves of Prunus Laurocerasus—the common or cherry laurel.

Aqua Laurocerasi. 1 lb. to 1 pint. (·1 per cent.)

A colourless liquid, prepared by distilling 1 pint from 1 lb. fresh cherry-laurel leaves and 2½ pints water, and making its strength correspond to ·1 per cent, real hydrocyanic acid.

Sedative; resembling Hydrocyanic Acid.

Dose—½ to 2 drams.

LAVANDULÆ OLEUM (Oil of Lavender)—From Labiatæ.

The almost colourless oil distilled in Britain from the flowers of Lavandula vera.

Stimulant, Carminative, and Antispasmodic. (Page 414.)

Dose—1 to 4 minims, in pill or on sugar or in emulsion.

IN—Linim. Camph. Co.

Spiritus Lavandulæ. 1 in 50.

Oil of lavender 1 oz. and rectified spirit 49 oz.

Dose—½ to 1 dram.

Tinctura Lavandulæ Composita. 45 minims to 1 pint.

A bright crimson liquid, prepared by macerating cinnamon and nutmeg of each 75 grs and red sandal-wood 150 grs. in rectified spirit 1 pint for 7 days, filtering, and adding oil of lavender 45 min. and oil of rosemary 5 min.

Dose—½ to 2 drs.

IN—Liquor Arsenicalis, as a colouring agent.

LIMONIS CORTEX (Lemon Peel)—Aurantiaceæ.

The outer part of the rind of the fresh fruit of Citrus Limonum.

Aromatic; chiefly used for its flavour. (Page 414.)

In addition to the following, it enters into Inf. Aurant. Co. and Inf. Gent. Co.

Oleum Limonis.

The pale yellow, fragrant, *volatile* oil obtained by mechanical means from the fresh lemon peel.

Dose—1 to 4 minims, but chiefly used for flavouring.

In—Lin. Pot. Iod. cum Sapone and Spt. Ammon. Aromat.

Succus Limonis. =36 to 46 grs. citric acid in 1 oz.

The freshly expressed juice of the ripe fruit of Citrus Limonum. A slightly turbid, yellowish liquid.

Refrigerant and Antiscorbutic. (Page 303.)

Dose—½ to 2 oz.

Syrupus Limonis. 1 of juice in 2.

A yellowish syrup, prepared by infusing fresh lemon peel 2 oz. in boiling lemon juice 1 pint, and adding 2¼ lb. sugar.

Dose—1 dram.

Tinctura Limonis. 2½ oz. to 1 pint.

A sherry-coloured liquid, prepared by macerating fresh lemon peel 2½ oz. in proof spirit 1 pint for 7 days.

Dose—½ to 2 drams.

LINI FARINA (Linseed Meal)—Linaceæ.

Powdered linseed. Enters into all the poultices except yeast.

Cataplasma Lini.

Linseed meal 4 oz. gradually mixed with boiling water 10 oz.

Lini Semina. Linaceæ.

The small, shining, oval, brown, pointed seeds of Linum usitatissimum, common flax.

Demulcent, Emollient, and Nutrient. (Page 414.)

Infusum Lini. 150 grs. to 10 oz. (2 hours).

Prepared by infusing for *two* hours linseed 150 grs., dried liquorice 50 grs., boiling water 10 oz.

Dose—2 to 5 oz.

Oleum Lini (Linseed Oil).

The viscid oil expressed in Britain without heat from linseed. Only used externally as an Emollient.

LITHII CARBONAS (Carbonate of Lithium) Li_2CO_3.

In a white powder, or in minute crystalline grains.

Diuretic and Antacid; acting like sodium and potassium.

Dose—3 to 6 grs., given in effervescing water. (Page 414.)

Liquor Lithiæ Effervescens. 10 grs. to 1 pint.

Carbonate of lithium 10 grs. in water 1 pint, charged at a pressure of four atmospheres with washed carbonic acid gas.

Dose—5 to 10 oz.

Lithii Citras. $Li_3C_6H_5O_7, 4H_2O$.

A white crystalline salt, prepared by adding carbonate of lithium to a solution of citric acid till effervescence ceases, and evaporating and setting aside for crystals to form.

Acts like the carbonate.

Dose—5 to 10 grs. in solution, freely diluted.

LOBELIA (Lobelia)—Lobeliaceæ.

The dried flowering herb of Lobelia inflata (Indian Tobacco), in compressed rectangular parcels of angular stems, alternate toothed hairy leaves and inflated fruits. (Page 415.)

Tinctura Lobeliæ. $2\frac{1}{2}$ oz. to 1 pint.

A greenish-brown liquid, prepared by macerating and percolating lobelia $2\frac{1}{2}$ oz. in No. 40 powder, with proof spirit 1 pint.

Diuretic, Expectorant, Emetic, and Antispasmodic.

Dose—10 to 30 minims.

Tinctura Lobeliæ Ætherea. $2\frac{1}{2}$ oz. to 1 pint.

A green liquid, prepared by *macerating* lobelia $2\frac{1}{2}$ oz. in coarse powder in spirit of ether 1 pint for 7 days.

Dose—10 to 30 minims.

LUPULUS (Humulus or Hop)—Urticaceæ.

The dried greenish-yellow strobiles or membranous cones of Humulus Lupulus, grown in England.

A Bitter Tonic and feeble Narcotic. (Page 416.)

***LUPULINUM** (Lupulin or Lupulinic Glands).

A granular bright yellow glandular powder, obtained from the dried strobiles of Humulus Lupulus.

Tonic, Anodyne, and Hypnotic. (Page 416 and 534.)

Dose—2 to 5 grs., in pill or powder.

Extractum Lupuli.

The dark-brown soft extract, prepared by evaporating a tincture of hop, making a decoction of the marc, which is like-

wise to be evaporated; the spirituous and aqueous extracts to be mixed, and the evaporation continued.

Dose—5 to 15 grs., in pill.

Infusum Lupuli. ½ oz. to 10 oz. (1 hour).

Prepared by infusing hop ½ oz. in boiling water 10 oz.

Dose—1 to 2 oz.

Tinctura Lupuli. 2½ oz. to 1 pint.

A deep-red liquid, prepared by macerating and percolating hop 2½ oz. with proof spirit 1 pint.

Dose—½ to 2 drams.

MAGNESIA PONDEROSA. Heavy Calcined Magnesia. **MgO.** Known as Heavy Magnesia.

A white insoluble powder, prepared by calcining heavy carbonate of magnesium in a loosely-covered crucible.

Antacid, Laxative, and Antilithic. (Page 416.)

Dose—10 to 60 grs. in milk.

May be used in Pulvis Rhei Co.

Magnesia Levis (Light Calcined Magnesia). **MgO.**

A bulky, white, insoluble powder, identical with the preceding, only lighter, bulk for bulk, in the ratio of 3½ to 1.

Prepared by calcining light carbonate of magnesium.

Dose—10 to 60 grs.

IN—Pulvis Rhei Compositus.

Magnesii Carbonas Ponderosa. $(MgCO_3)_3,Mg(HO)_2,4H_2O$.

Heavy carbonate of magnesium. It is a white granular powder, prepared by mixing *strong* hot solutions of sulphate of magnesium and carbonate of sodium, washing and drying the precipitate by a heat not exceeding 212°.

Dose—10 to 40 grs. as an Antacid, 1 to 2 drs. as a Purgative.

IN—Liq. Magnes. Carb. and Troch. Bismuthi.

Magnesii Carbonas Levis. $(MgCO_3)_3,Mg(HO)_2,4H_2O$.

Light carbonate of magnesium. A very light, partially amorphous powder, prepared by mixing *weak* cold solutions of sulphate of magnesium and carbonate of sodium, boiling, washing the precipitate, and drying by a heat not exceeding 212°.

Dose—10 to 60 grs.

Used in Vapor Olei Pini Sylvestris.

Liquor Magnesii Carbonatis. 10 grs. in 1 oz.

A colourless liquid, prepared by boiling together a solution of sulphate of magnesium 2 oz. in water 10 oz., and a solution of carbonate of sodium 2½ oz. in water 10 oz., washing care-

fully the precipitated carbonate of magnesium, mixing it with distilled water 1 pint, and passing pure carbonic acid gas, at three pressures, through it till dissolved. Known as "Fluid Magnesia."

Antacid and mildly Purgative.

Dose—1 to 2 oz.; ½ dram for a child 1 year old.

Liquor Magnesii Citratis. About 15 grs. Mag. Cit. in 1 oz.

Dissolve citric acid 200 grs. in water 2 oz., add carbonate of magnesium 100 grs., filter into a strong half-pint bottle, and add syrup of lemons ½ oz., fill up with water, and add bicarbonate of potassium 40 grs., and cork quickly, tying down with wire.

Antacid and Cathartic.

Dose—5 to 10 oz.

Magnesii Sulphas. $MgSO_4,7H_2O$.

Commonly known as Epsom salt, in minute, colourless, rhombic prisms; 3 oz. dissolve in about 4 oz. water.

Hydragogue Purgative. (Page 417.)

Dose—1 to 4 drs.

In addition to the Enema, it enters into Mist. Sennæ Co., 1 in 5.

Enema Magnesii Sulphatis. 1 in 16.

Composed of sulphate of magnesium 1 oz., olive oil 1 oz., mucilage of starch 15 oz.—for one enema.

MANGANESII OXIDUM NIGRUM (Black Oxide of Manganese). MnO_2.

A heavy, black powder, used in producing Cl. and $KMnO_4$.

MANNA (Manna)—Oleaceæ.

A concrete saccharine exudation from transverse incisions in the stems of cultivated trees of Fraxinus Ornus, in stalactiform, porous, uneven, dirty-white pieces.

Laxative; chiefly used for children. (Page 419.)

Dose—1 dram to 1 oz.; 10 to 20 grs. for a child 1 year old.

MARMOR ALBUM (White Marble). $CaCO_3$.

Crystalline native carbonate of lime, in hard, white masses.

Used for producing carbonic acid gas.

MASTICHE (Mastich)—Anacardiaceæ.

A resinous exudation, in small, irregular, brittle, yellow tears; obtained by incision from the stem of Pistacia Lentiscus.

Chiefly used for its physical properties in pill masses.

MATICÆ FOLIA (Matico Leaves)—Piperaceæ.

The dried, long, pointed leaves, with a square network of intersecting veins on their surface, of Piper angustifolium (Artanthe elongata), 4 to 8 inches long, and hairy.

An Aromatic Stimulating Tonic and local Styptic. (P. 419.)

Dose—½ to 1 dram, in powder.

Infusum Maticæ. ½ oz. to 10 oz. (½ hour).

Matico leaves ½ oz., infused in boiling water 10 oz.

Dose—1 to 4 oz.

MEL (Honey).

A viscid, translucent, brownish-yellow liquid, gradually becoming opaque and crystalline, being the saccharine secretion deposited in the honeycomb by Apis mellifica, the hive bee.

Demulcent and Laxative. (Page 419.)

Dose—1 dr. to 1 oz. Generally used for its sweetness.

Mel Depuratum (Clarified Honey).

Honey strained whilst hot through wetted flannel.

Enters, in addition to the following, into Confections of Pepper, Scammony, and Turpentine.

Mel Boracis. 46 grs. in 1 oz.

Prepared by rubbing borax 60 grs. with clarified honey 480 grs., and glycerine 30 grs. It is almost liquid, and resembles honey.

Alterative to diseased mucous surfaces. (Page 338.)

Oxymel. 4 in 5.

A thick syrupy liquid, composed of clarified honey 40 oz., acetic acid 5 oz., water 5 oz., mixed with heat.

Expectorant, but chiefly used as a vehicle.

Dose—1 to 2 drs.

Oxymel Scillæ (Oxymel of Squill).

An opalescent brownish liquid, composed of vinegar of squill 1 pint, clarified honey 2 lbs., evaporated till of the S.G. of 1·32.

Expectorant. (Page 473.)

Dose—½ to 1 dr.

MENTHÆ PIPERITÆ OLEUM (Oil of Peppermint).

The colourless or pale yellow oil distilled in Britain from the fresh flowering herb of Mentha piperita (Labiatæ).

Stimulant, Antispasmodic, and Carminative. (Page 420.)

Dose—1 to 4 minims, on sugar, in pill, or in emulsion.

It enters into Pil. Rhei Co., Tr. Chlorof. et Morph., and the following :—

Aqua Menthæ Piperitæ. 1½ dr. to 1 gallon.

A colourless liquid, prepared by mixing oil of peppermint 1½ drams with water 1½ gallons, and distilling 1 gallon.

Dose—1 to 2 oz.; 1 dram for a child 1 year old.

IN—Mistura Ferri Aromatica.

Essentia Menthæ Piperitæ. 1 in 5.

Oil of peppermint 1 oz. dissolved in rectified spirit 4 oz.

Dose—10 to 20 minims.

Spiritus Menthæ Piperitæ. 1 in 50.

Oil of peppermint 1 oz. and rectified spirit 49 oz.

Dose—½ to 1 dram ; 2 to 4 minims for a child 1 year old.

MENTHÆ VIRIDIS OLEUM (Oil of Spearmint).

The colourless or pale yellow oil distilled in Britain from the fresh flowering Mentha viridis (Labiatæ).

Action and dose similar to peppermint. (Page 420.)

Aqua Menthæ Viridis. 1½ dr. to 1 gallon.

A colourless liquid, obtained by mixing oil of spearmint 1½ drs. and water 1½ gallons, and distilling 1 gallon.

Dose—1 to 2 oz.; 1 dr. for a child 1 year old.

***MENTHOL** (Peppermint Camphor). $C_{10}H_{20}O$.

A stearoptene in colourless crystals, or in fused crystalline masses, obtained by cooling the oil distilled from Mentha arvensis, vars. piperascens, and glabrata; and of M. piperita.

A powerful Antiseptic and Antineuralgic. (Page 420.)

Dose—½ to 2 grs. in pill ; or externally rubbed on the skin as a local Anæsthetic.

MEZEREI CORTEX (Mezereon Bark)—Thymelaceæ.

The dried bark, in tough brown strips or quilled pieces of various lengths, of Daphne Mezereum or of Daphne Laureola.

Diuretic, Alterative, and externally Vesicant. (Page 420.)

Dose—10 to 15 grs., in decoction. Seldom used.

Enters into Dec. Sarsæ Co. 55 grs. to 1 pint.

Extractum Mezerei Æthereum.

A dark-green soft extract, prepared by evaporating a strong tincture of mezereon and macerating the residue with ether, which is poured off, filtered, and evaporated.

Enters into Lin. Sinapis Co. 8 grs. to 1 oz.

MICA PANIS (Bread Crumb).

The soft crumb of bread. Enters into Cataplasma Carbonis.

MORI SUCCUS (Mulberry Juice)—Urticaceæ.

The purple juice of the ripe mulberry, Morus nigra.

Laxative and Refrigerant. (Page 421.)

Syrupus Mori. 1 in 2.

A deep-red syrup, prepared by dissolving $2\frac{1}{4}$ lbs. sugar in 1 pint mulberry juice, and adding $2\frac{1}{2}$ oz. spirit.

Dose—1 dram.

MORPHINÆ ACETAS (Acetate of Morphine).

$C_{17}H_{19}NO_3,HC_2H_3O_2,3H_2O$.

A white soluble powder, prepared by mixing a solution of hydrochlorate of morphine with solution of ammonia, and thus precipitating pure morphine, which, when washed, is dissolved in acetic acid and water, and the solution, on evaporation, yields acetate of morphine. May be prepared from pure morphine

Anodyne and Narcotic. (Page 429.)

Dose—$\frac{1}{8}$ to $\frac{1}{2}$ gr., in solution, or in pill.

Liquor Morphinæ Acetatis. 1 in 100.

An almost colourless liquid, prepared by dissolving acetate of morphine 9 grs. in distilled water 12 drs., to which rectified spirit 4 drs. and dilute acetic acid 18 minims have been added.

Dose—10 to 60 minims.

It may also be prepared by diluting the following:

Injectio Morphinæ Hypodermica. 1 gr. in 10 minims.

A clear solution, prepared by adding solution of ammonia to hydrochlorate of morphine 92 grs. dissolved in water 2 oz., so that all the morphine is thrown down; the precipitate is then carefully dissolved in water, with enough acetic acid to make a slightly acid solution, which is to measure 2 oz.

Dose—by subcutaneous injection—1 to 5 minims.

Morphinæ Hydrochloras (Hydrochlorate of Morphine).

$C_{17}H_{19}NO_3,HCl,3H_2O$.

In white, fine, silky prisms, obtained by a complicated process from opium, of which the following is an outline:—

Opium is thoroughly exhausted by water, and the solution concentrated. To this chloride of calcium is added, which produces meconate of calcium and hydrochlorate of morphine, and the liquid is evaporated till solidification occurs. Out of this solid cake the impure hydrochlorate is washed repeatedly with hot water, the solution digested with animal charcoal to destroy its colour, and precipitated by ammonia, which throws down pure morphine. This is washed and suspended in hot water, and hydrochloric acid added to form a neutral solution, out of which the salt crystallises on cooling.

Action, dose, and strength similar to the acetate of morphine.

Liquor Morphinæ Hydrochloratis. 1 in 100.

A colourless liquid, prepared by dissolving hydrochlorate of morphine 9 grs. in distilled water 12 drs., to which rectified spirit 4 drs. and dilute hydrochloric acid 18 minims have been added.

Dose—10 to 60 minims.

***Liquor Morphinæ Bimeconatis.** $1\frac{1}{4}$ in 100.

A nearly colourless solution of Bimeconate of Morphine ($C_{17}H_{19}NO_3$, $C_7H_4O_7$), prepared by dissolving 9 grs. hydrochlorate of morphine in water, precipitating with ammonia, and adding to the pure morphine thus thrown down 6 grs. meconic acid, 4 drs. spirit, and water $1\frac{1}{2}$ oz.

Action same as Acetate of Morphine.

Dose—5 to 40 minims. It is of the same strength as Tr. Opii.

Suppositoria Morphinæ. $\frac{1}{2}$ gr. in each.

Composed of hydrochlorate of morphine 6 grs. and oil of theobroma 174 grs., in 12 conical suppositories.

One to be used at a time.

Suppositoria Morphinæ cum Sapone. $\frac{1}{2}$ gr. and $8\frac{1}{2}$ grs.

Composed of hydrochlorate of morphine 6 grs., glycerine of starch 30 grs., curd soap 100 grs., powdered starch q.s. to make a suitable paste, which is to be divided into 12 cones.

One to be used at a time.

Trochisci Morphinæ. $\frac{1}{30}$ gr. in each.

White lozenges, composed of hydrochlorate of morphine 20 grs., tincture of tolu $\frac{1}{2}$ oz., sugar 24 oz., powdered gum acacia 1 oz., water $\frac{1}{2}$ oz., mucilage of acacia q.s., in 720 lozenges.

Dose—1 to 6 lozenges.

Trochisci Morphinæ et Ipecacuanhæ. $\frac{1}{30}$ and $\frac{1}{12}$ gr.

Whitish lozenges, prepared by adding 60 grs. of ipecacuanha to the quantities in the preceding before dividing.

Dose—1 to 6 lozenges.

***Tinctura Chloroformi et Morphinæ.** (See Page 205.)

***MORPHINÆ SULPHAS.** $(C_{17}H_{19}NO_3)_2$, H_2SO_4, $5H_2O$.

Colourless silky crystals, obtained as in the process for the hydrochlorate by diffusing the morphine in boiling water, and adding sulphuric acid to form a neutral solution from which the salt will crystallise.

Dose—$\frac{1}{8}$ to $\frac{1}{2}$ gr. Acts like the hydrochlorate and acetate.

☞ 1 gr. morphine is contained in 10 grs. powdered opium.

See table of preparations on page 250.

MORRHUÆ OLEUM (Cod-Liver Oil).

The pale-yellow oil extracted from the fresh liver of the cod —Gadus Morrhua—by a heat not exceeding 180°.

A Nutritive Tonic. (Page 421.)

Dose—1 to 8 drs., in emulsion, or in milk, coffee, porter, &c.

MOSCHUS (Musk).

The dried secretion from the preputial follicles of Moschus moschiferus, in small, irregular, reddish-black grains.

Stimulant and Antispasmodic. (Page 424.)

Dose—5 to 10 grs., in bolus or emulsion.

MYRISTICA (Nutmeg)—Myristicaceæ.

The oval, furrowed kernel of the seed of Myristica fragrans (M. officinalis); the transverse section has a marbled appearance.

Aromatic, Carminative, and Narcotic. (Page 424.)

Dose—5 to 10 grs., in powder in milk.

In addition to the following, Nutmeg enters into the composition of Pulv. Catechu Co., Pulv. Cretæ Arom., Spt. Armoraciæ Co., and Tinct. Lavand. Co.

Oleum Myristicæ (*Volatile* Oil of Nutmeg).

The pale-yellow oil distilled in Britain from nutmeg.

Dose—1 to 4 minims, on sugar.

Enters into Pil. Aloes Socot., Spt. Ammon. Aromat., and Spt. Myristicæ.

Oleum Myristicæ Expressum (Expressed Oil of Nutmeg).

A concrete, yellow, soft solid, obtained by expression and heat from nutmeg.

Enters into the composition of Emp. Calefaciens, and Emp. Picis.

Spiritus Myristicæ. 1 in 50.

Volatile oil of nutmeg 1 oz. and rectified spirit 49 oz.

Dose —½ to 1 dram.

Enters into Mistura Ferri Composita.

MYRRHA (Myrrh)—Amyridaceæ.

A gum-resinous exudation, in irregular brownish-yellow or red tears or masses, from the stem of Balsamodendron Myrrha.

A Stimulating Tonic and Expectorant. (Page 424.)

Dose—10 to 30 grs., in powder.

Enters into Dec. Aloes Co., Mist. Ferri. Co., Pil. Aloes et Myrrhæ, Asafœtidæ Co., and Pil. Rhei. Co.

Tinctura Myrrhæ. 2½ oz. to 1 pint.

A pale-brown liquid, prepared by macerating and percolating myrrh 2½ oz. with rectified spirit 1 pint.

Dose—½ to 1 dram, in sherry, or in emulsion. Page 36.

NECTANDRÆ CORTEX (Bebeeru Bark)—Lauraeeæ.

In large, flat, heavy, greyish-brown pieces, 1 to 2 feet long, 2 to 6 inches broad, and $\frac{1}{4}$ inch thick, from Nectandra Rodiæi.

Antiperiodic and Tonic; somewhat resembling quinine, but only used in the preparation of Beberinæ Sulphas.

***NITROGLYCERINI TABELLÆ** (Tablets of Nitroglycerine).

Tablets of chocolate, each weighing $2\frac{1}{2}$ grs., and containing $\frac{1}{100}$ gr. pure nitroglycerine.

Dose—1-2 tablets; action like Amyl. Nitris. (Page 424.)

NUX VOMICA (Nux Vomica)—Loganiaccæ.

The circular, button-shaped seeds, about 1 inch in diameter, covered with short, satiny hairs, of Strychnos Nux Vomica.

Tonic, and Stimulant to the Spinal Cord. (Page 425.)

Dose—$\frac{1}{2}$ to 3 grs., in powder. It is the source of Strychnine.

Extractum Nucis Vomicæ.

A brown extract, prepared by evaporating a strong spirituous tincture of nux vomica till the resulting extract be estimated carefully to contain *15 per cent. of total alkaloids.*

Dose—$\frac{1}{3}$ to $\frac{3}{4}$ gr.

Tinctura Nucis Vomicæ. 1 gr. of Alkaloids in 1 oz.

A sherry-coloured liquid, prepared by dissolving 133 grs. extract nux vomica in 4 oz. water and 16 oz. rectified spirit.

Dose—10 to 20 minims.

OLIVÆ OLEUM (Olive Oil)—Oleaeeæ.

The yellow oil expressed from the ripe fruit of Olea europæa.

Dose—2 drs. to 1 oz. as a Laxative. (Page 428.)

IN—Charta Epispast., 1 Enema, 5 plasters, 4 ointments, and 3 liniments.

OPIUM (Opium)—Papaveraeeæ.

The juice inspissated by spontaneous evaporation obtained by incision from the unripe capsules of the poppy—Papaver somniferum, grown in Asia Minor—in irregular lumps of from $\frac{1}{2}$ to 2 lbs., enveloped in fragments of poppy leaves, and, when fresh, tearing with an irregular, moist, brown surface: 100 grs. of the dry powder should yield about 10 grs. morphine, but any opium is officially permitted as a source of alkaloids.

Anodyne and Narcotic. (Page 429.)

Dose—$\frac{1}{2}$ to 3 grs.

Pulvis Opii. Opium in powder (of a rich brown colour).

☞ Although it is not recognised under a separate heading, it is inserted here to remind the student that opium cannot be powdered until it is first

thoroughly dried, and that in drying it loses water, and in grinding there is a further loss of inert woody fibrous impurities, and the powder is stronger than the fresh opium by about $\frac{1}{8}$, 7 grs. being equal to 8 of opium.

Confectio Opii. 1 in 40.

A soft brown mass, composed of compound powder of opium 100 grs. rubbed with syrup 300 grs.

Anodyne, Antispasmodic, and Carminative.

Dose—5 to 20 grs.

Emplastrum Opii. 1 in 10.

A hard brown solid, prepared by heating resin plaster 9 oz., and adding, by degrees, powdered opium 1 oz.

Enema Opii. $\frac{1}{2}$ dr. tinct. to 2 oz.

A thick opaque liquid, prepared by mixing tincture of opium $\frac{1}{2}$ dr. with mucilage of starch 2 oz. For one enema.

Extractum Opii. 1 from 2 of opium. (20 per cent. Morphine).

A dark-brown, tough extract, prepared by evaporating a cold infusion of 1 lb. powdered opium, till the product weighs $\frac{1}{2}$ lb.

Dose—$\frac{1}{2}$ to 2 grs. It is much stronger than powdered opium, and is said to be less stimulating.

IN—Trochisci Opii one-tenth gr. in each, in Vinum Opii 1 oz. to 1 pint, and in the following:—

Extractum Opii Liquidum. 22 grs. Extract in 1 oz.

A dark-brown liquid, consisting of extract of opium 1 oz., dissolved in distilled water 16 oz., and rectified spirit 4 oz.

Dose—10 to 40 minims. It should yield about 1 per cent. of morphine.

☞ Though slightly weaker, this is regarded as the representative of Battley's Sedative Liquor.

Linimentum Opii. 1 in 2.

An almost black liquid, consisting of equal parts laudanum and soap liniment.

Pilula Ipecacuanhæ cum Scilla. 1 in 23.

A brown mass, composed of Dover's powder 3 oz., squill 1 oz., ammoniacum 1 oz., treacle q.s., beaten together.

In addition to its Narcotic action, it is decidedly Expectorant.

Dose—5 to 10 grs.

Pilula Plumbi cum Opio. 1 in 8.

A brownish-black mass, composed of acetate of lead 36 grs., opium in powder 6 grs., and confection of roses 6 grs.

Astringent as well as Narcotic. (Should be made fresh.)
Dose—3 to 5 grs.

Pilula Saponis Composita. 1 in 6.

A light-brown mass, composed of opium in powder ½ oz., hard soap 2 oz., glycerine q.s., beaten together.
Dose—3 to 5 grs.

Pulvis Cretæ Aromaticus cum Opio. 1 in 40.

A pale-brown powder, composed of opium ¼ oz. aromatic chalk powder 9¾ oz.
Carminative and Anodyne; well adapted for children.
Dose—10 to 40 grs.; for a child 1 year old, ½ to 1 gr.

Pulvis Ipecacuanhæ Compositus. 1 in 10.

Dover's powder. A fawn-coloured powder, composed of ipecacuanha and opium of each ½ oz., sulphate of potassium 4 oz.
Diaphoretic, Anodyne, and Expectorant.
Dose—5 to 15 grs., in pill, or as a powder.
IN—Pilula Ipecacuanhæ cum Scilla.

Pulvis Kino Compositus. 1 in 20.

A dark-red powder, composed of kino 3¾ oz., opium ¼ oz., cinnamon 1 oz.
Astringent and Narcotic.
Dose—5 to 20 grs.

Pulvis Opii Compositus. 1 in 10.

A brown powder, composed of opium 1⅓ oz., black pepper 2 oz., ginger 5 oz., caraway 6 oz., tragacanth ½ oz.
Carminative and Narcotic.
Dose—2 to 5 grs.
IN—Confectio Opii. 1 in 4, or 1 of opium in 40.

Suppostoria Plumbi Composita. 1 gr. opium in each.

Composed of acetate of lead 3 grs., opium 1 gr., oil of theobroma 11 grs.

Tinctura Camphoræ Composita. 2 grs. in 1 oz.

"Paregoric." A sherry-coloured liquid, composed of *powdered* opium 40 grs., benzoic acid 40 grs., camphor 30 grs., oil of anise 30 minims, proof spirit 1 pint, macerated for 7 days, and filtered.
Anodyne, Expectorant, and Stimulant.
Dose—¼ to 1 dram. For a child 1 year old, 4 minims. This is the only safe liquid preparation of opium for infants.

Tinctura Opii. 1½ oz. to 1 pint, or 33 grs. in 1 oz.

A dark reddish-brown liquid, prepared by macerating *powdered* opium 1½ oz. in proof spirit 1 pint. Commonly known as Laudanum. Contains 3·3 grs. morphine in 1 oz.

It should be carefully noted that by ordering *powdered* opium in the Tinctures, the new B.P. has raised the strength of these preparations. Formerly opium in "*coarse*" powder was ordered, and this did not practically mean that thorough drying of the crude drug which is essentially necessary to produce Pulvis Opii. Hence the percentage is slightly raised.

Dose—5 to 40 minims.

Narcotic and Anodyne.

IN—Enema Opii and Linimentum Opii.

Tinctura Opii Ammoniata. 100 grs. to 1 pint. 5 grs. in 1 oz.

A dark reddish-brown liquid, prepared by macerating *powdered* opium 100 grs., saffron and benzoic acid of each 180 grs., oil of anise 1 dram, in strong solution of ammonia 4 oz. and rectified spirit 16 oz. Known as Scotch Paregoric.

A stimulating Anodyne and Expectorant.

Dose—½ to 1 dram, freely diluted.

Trochisci Opii. $\frac{1}{10}$ gr. extract in each.

Brown lozenges, composed of extract of opium 72 grs., tincture of tolu ½ oz., sugar 16 oz., gum acacia 2 oz., extract of liquorice 6 oz., distilled water q.s., divided into 720 lozenges.

Narcotic and Anodyne.

Dose—1 to 6 lozenges.

Unguentum Gallæ cum Opio. 32 grs. to 1 oz., or 1 in 1½.

A brown ointment, prepared by rubbing up powdered opium 32 grs. with ointment of galls 1 oz.

A soothing Anodyne to painful hæmorrhoids.

Vinum Opii. 22 grains of extract in 1 oz.

A brown liquid, prepared by macerating for 7 days, extract of opium 1 oz., cinnamon and cloves of each 75 grs., in sherry 1 pint—same strength as the fluid extract.

Anodyne. Sometimes used locally in ophthalmia.

Dose—10 to 40 minims.

☞ The brown *colour* and heavy peculiar *smell* of the preparations containing crude opium distinguish the majority of them from most harmless or inert preparations. The student should remember that this remark does not apply to the more powerful preparations containing the acetate and hydrochlorate of morphine.

Preparations containing Opium, but under another name :—

NAME.	MADE WITH	STRENGTH.	DOSE.
Codeina	Morphine liquors.	..	$\frac{1}{4}$ to 2 grs.
Pilula Ipec. cum Scilla	Dover's Powder..	1 in 23.	5 to 10 gr.
Pilula Plumbi cum Opio	Opium Powdered	1 in 8.	3 to 5 gr.
Pilula Saponis Co. ..	Do. Do.	1 in 6.	3 to 5 gr.
Pulvis Cretæ Aromat. cum Opio	Do. Do.	1 in 40.	10 to 40 gr.
Pulvis Ipecac. Co. ..	Do. Do.	1 in 10.	5 to 15 gr.
Pulv. Kino Co.	Do. Do.	1 in 20.	5 to 20 gr.
Suppositoria Plumbi Composita. ..	Do. Do.	1 gr. in each.	1 for a dose.
Tinct. Camphoræ Co. ..	Opium Powdered.	2 gr. to 1 oz.	$\frac{1}{4}$ to 1 dr.
Ungt. Gallæ cum Opio	Opium Powdered.	32 gr. to 1 oz.	..

MORPHINE.

Thongh Apomorphine is entirely different from Morphine, it is included here for the convenience of the student.

Apomorphinæ Hydroch	Morphine or Codeine		$\frac{1}{16}$ to $\frac{1}{4}$ gr. ..
Injec. Apomoph. Hypo.	Hydrochl. of Apomorphine ..	1 in 50.	2 to 8 min.
Morphinæ Acetas ..	1 grain will produce as much effect as	6 to 8 grs. opium.	$\frac{1}{8}$ to $\frac{1}{6}$ gr.
Liq. Morphinæ Acet. ..	Acetate	1 in 100.	10 to 60 min.
Injectio Morphinæ Hypoderm.	Hydrochlorate ..	1 gr. in 10 m.	1 to 6 min.
Morph. Hydrochl. ..	1 grain will produce as much effect as	6 to 8 grs. opium.	$\frac{1}{8}$ to $\frac{1}{6}$ gr.
Liq. Morp. Hydrochlor.	Hydrochlorate ..	1 in 100.	10 to 60 min.
Suppositoria Morphinæ	Hydrochlorate ..	$\frac{1}{2}$ gr. in each.	1 for a dose.
Do. cum Sapone ..	Hydrochlorate ..	$\frac{1}{2}$ gr. in each.	Do.
Tr. Chlorof. et Morph.	Hydrochlorate ..	1 gr. in 1 oz.	5 to 10 min.
Trochisci Morph. ..	Hydrochlorate ..	1-36 gr. in ea.	1 to 6.
Do. et Ipecac. ..	Hydrochlorate ..	1-36 gr. in ea.	1 to 6.
Morphinæ Sulphas ..	1 gr. will produce as much effect as ..	6 to 8 grs. opium.	$\frac{1}{8}$ to $\frac{1}{6}$ gr.
Liq. Morph. Bimec ..	Hydrochlorate ..	$1\frac{1}{4}$ in 100.	5 to 40 mins.

PREPARATIONS BEARING THE NAME OF "OPII."

PREPARATION.	MADE WITH	STRENGTH.	DOSE.
Confectio ..	The Compound Powder of Opium	1 in 40	5 to 20 grs
Emplastrum ..	Opium in fine powder ..	1 in 10	..
Enema	Tincture of Opium ..	½ dr. to 2 oz.	2 oz.
Extractum ..	Opium in thin slices ..	½ stronger than opium	½ gr. to 2 grs.
Extractum Liquidum ..	Extract of Opium	22 gr. to 1 oz.	10 to 40 m.
Linimentum ..	Tincture of Opium ..	1 in 2	..
Pulvis Compositus	Opium in powder ..	1 in 10	2 to 5 grs.
Tinctura ..	Do. in powder ..	33 gr. to 1 oz.	5 to 40 m.
Tinct. Ammon.	Do. Do. ..	5 gr. to 1 oz.	½ to 1 dr.
Trochisci ..	Extract of Opium ..	1-10 gr. each	1 to 6.
Vinum	Extract of Opium ..	22 gr. to 1 oz.	10 to 40 m.

OS USTUM (Bone Ash).

The residue of bones which have been burned to a white ash in contact with air, consisting of phosphate of calcium, with 10 per cent. carbonate of calcium and a little fluoride of calcium, silica, and phosphate of magnesium.

Used in the preparation of the phosphates of sodium and calcium.

OVI ALBUMEN (Egg Albumen).

The liquid white of the egg of Gallus Bankiva.

OVI VITELLUS (Yolk of Egg).

Of Gallus Bankiva. The common hen.

Enters into Mistura Spiritus Vini Gallici.

OXYMEL and OXYMEL SCILLÆ. (See under Mel and Scilla).

PAPAVERIS CAPSULÆ (Poppy Capsules)—Papaveraceæ.

The large, globular, crowned, dried, nearly ripe capsules of the white poppy, Papaver somniferum. Grown in Britain.

Anodyne and Narcotic; resembling opium. (Page 134.)

Decoctum Papaveris. 2 oz. to 1 pint.

Prepared by boiling poppy capsules 2 oz. in distilled water 1½ pint for ten minutes, and making the strained product measure one pint.

Used as an Anodyne application to painful parts.

Extractum Papaveris.

A brownish-black extract, prepared by evaporating 1 gallon of an infusion of the seedless capsules (made by displacement) to 1 pint, and adding 2 oz. rectified spirit, filtering, and continuing the evaporation till a proper consistence is reached.

Dose—2 to 5 grs., in pill.

Syrupus Papaveris. 1 in $2\frac{1}{6}$.

A dark-brown syrup, prepared by exhausting 36 oz. of bruised seedless poppy capsules with 2 gallons of boiling distilled water, reducing the infusion to 3 pints by evaporation on a water-bath, and adding 16 oz. rectified spirit when cold; this liquid, after settling, is filtered, and the spirit distilled off till 2 pints are left behind, in which 4 lbs. sugar are to be dissolved.

Anodyne and Narcotic.

Dose—1 dram; should not be given to very young children.

*PARAFFINUM DURUM (Hard Paraffin.)

A colourless, translucent, waxy-looking substance, melting between 110° and 145° F., being a mixture of several of the harder members of the paraffin series of hydrocarbons; obtained by distillation from shale, and purified after separation of the liquid oils by refrigeration.

Used as a basis for ointments, into 9 of which it enters.

*PARAFFINUM MOLLE (Soft Paraffin, or Vaseline).

A white or yellowish, translucent, semi-solid mixture of some of the softer or more fluid members of the paraffin series of hydrocarbons; usually obtained by purifying the less volatile portions of petroleum, and known in commerce by various fanciful names.

Externally—Emollient and Protective; used as a basis for ointments, into 11 of which it enters. (Page 434.)

PAREIRÆ RADIX (Pareira Root)—Menispermaceæ.

The dried root of Chondrodendron tomentosum, in long, cylindrical pieces, from $\frac{3}{4}$ to 3 inches thick, showing on cross section medullary rays and concentric rings. Called Pareira Brava. (Page 434.)

Diuretic, and Anodyne to the mucous lining of the bladder.

Decoctum Pareiræ. $1\frac{1}{4}$ oz. to 1 pint.

Prepared by boiling pareira root, in No. 20 powder, $1\frac{1}{4}$ oz. in distilled water, 1 pint for 15 minutes, and making the strained product to measure 1 pint.

Dose—1 to 2 oz.

Extractum Pareiræ.

A brownish-black extract, prepared by exhausting pareira root with boiling water and evaporating the liquid by a water-bath.

Dose—10 to 30 grs.

Extractum Pareiræ Liquidum. 1 in 4 of Extract.

A black liquid, prepared by dissolving 4 parts of the extract of pareira in a mixture of 1 part of spirit and 3 of water, to form 16 parts of liquid extract.

Dose—$\frac{1}{2}$ to 2 drs.

PEPSIN (Pepsin).

A light, yellowish-brown powder, prepared by pulverising the pulp (carefully dried under 100° by spreading on glass) obtained by scraping the mucous membrane of the fresh stomach of the pig, sheep, or calf.

An artificial Digestive. (Page 435.)

Dose—2 to 5 grs., in powder, or in pill with glycerine.

PHOSPHORUS. P.

A semi-transparent, colourless, wax-like, solid, non-metallic element, prepared from bones.

Nervine Tonic and Stimulant to the reproductive centres.

Dose—$\frac{1}{30}$ gr., in pill. (Page 436.)

Used in the preparation of Acid. Phosph. Dil. and Concentratum.

Oleum Phosphoratum. 4 grs. to 1 oz., or about 1 per cent.

A clear, almost colourless oil, phosphorescent in the dark, prepared by heating 4 oz. almond oil to 300°, filtering when cold, and dissolving in it at a temperature of 180° 16 grs. phosphorus, with constant agitation.

Dose—5 to 10 minims—*i.e.*, $\frac{1}{2}\frac{1}{4}$ to $\frac{1}{12}$ gr. of phosphorus.

Pilula Phosphori. 1 in 90, including soap.

Prepared by rubbing together under water (at 140°) phosphorus 3 grs., balsam of tolu 120 grs., and yellow wax 57 grs., till thoroughly incorporated. The mass should be kept immersed in cold water, and 1 gr. of curd soap added to every 2 grs. of mass immediately before dispensing.

Dose—2 to 4 grs.—*i.e.*, $\frac{1}{4}\frac{1}{8}$ to $\frac{1}{2}\frac{1}{2}$ grs. of phosphorus.

PHYSOSTIGMATIS SEMEN (Calabar Bean)—Leguminosæ.

A large, kidney-shaped, brown, dried seed, with a furrow along its convex margin, of Physostigma venenosum.

Causes contraction of the iris when applied locally.

Dose—1 to 4 grs., in powder or in pill. (Page 438.)

Extractum Physostigmatis.

A dark-brown soft extract, prepared by evaporating a strong tincture of Calabar bean made with rectified spirit.

Dose—$\frac{1}{16}$ to $\frac{1}{4}$ gr., in pill.

Used in making the following :—

***Physostigmina** (Physostigmine or Eserine). $C_{15}H_{21}N_3O_2$.

An alkaloid, in pinkish or colourless crystals, obtained by dissolving extract of Calabar bean in water, adding bicarbonate of sodium, shaking the mixture with ether, and evaporating the ethereal liquid.

A Myotic or pupil contractor.

***Lamellæ Physostigminæ** (Discs of Eserine or Physostigmine.)

Discs of gelatine, with some glycerine, each weighing about $\frac{1}{50}$ gr. and containing $\frac{1}{1000}$ gr. physostigmine.

Used to cause contraction of the pupil.

***PILOCARPINÆ NITRAS** $C_{11}H_{16}N_2O_2,HNO_3$.

Nitrate of Pilocarpine. An alkaloid, obtained from extract of jaborandi by agitation with chloroform and a little alkali, evaporating, neutralising with nitric acid and recrystallising. In minute acicular crystals, or as a white powder.

Diuretic, Diaphoretic, Sialagogue, and Expectorant. (P. 410.)

Dose—$\frac{1}{20}$ to $\frac{1}{2}$ gr., in pill or in solution.

PIMENTA (Pimento or Allspice)—Myrtaceæ.

The small, round, rough, brown, dried, unripe berries of the allspice tree—Pimenta officinalis (Eugenia Pimenta).

Stimulant and Carminative. (Page 438.)

Aqua Pimentæ. 14 oz. to 1 gallon.

A brownish unstable preparation, obtained by mixing allspice 14 oz. with water 2 gallons, and distilling off 1 gallon.

Dose—1 to 2 oz.

Oleum Pimentæ.

An oil (colourless when prepared, but soon becoming brown) distilled in Britain from pimento or allspice. *It sinks in water.*

Dose—1 to 4 minims, in pill, or on sugar, or in an emulsion.

***PINI SYLVESTRIS OLEUM** (Fir-Wool Oil)—Coniferæ.

The nearly colourless oil distilled from the fresh leaves of Pinus sylvestris—the Scotch fir.

Rubefacient and Astringent like turpentine.

***Vapor Olei Pini Sylvestris.** 5 minims in each inhalation.

Prepared by mixing 40 minims fir-wool oil with 20 grs. light carbonate of magnesium and adding water to 1 oz. Of this 1 dr. is put into a suitable apparatus with $\frac{1}{2}$ pint of cold and

½ pint of boiling water, and air passed through which may be afterwards inhaled.

PIPER NIGRUM (Black Pepper)—Piperaceæ.

The small, round, wrinkled, brownish-black, dried, unripe berries of Piper nigrum.

Aromatic, Stimulant, and Carminative. (Page 439.)

Dose—10 to 20 grs., in powder.

It enters into Confect. Opii., Pulv. Opii Co., and the following :—

Confectio Piperis. 1 in 10.

An almost black paste, prepared by mixing black pepper 2 oz., caraway fruit 3 oz., with honey, 15 oz. Resembles and is sometimes called Ward's paste, and is in repute as an internal remedy for hæmorrhoids.

Dose—1 to 2 drams.

PIX BURGUNDICA (Burgundy Pitch)—From Coniferæ.

A hard, brittle, yellow solid, being a resinous exudation from the stem of Pinus Picea (P. Abies; A. excelsa) melted and strained. Seldom used except to impart solidity and Rubefacient qualities to plasters. (Page 440.)

It enters into Emplastrum Ferri and the following :—

Emplastrum Picis. 1 in 2.

A yellow solid, composed of Burgundy pitch 26 oz., frankincense 13 oz., resin and yellow wax of each 4½ oz., expressed oil of nutmeg 1 oz., olive oil and water of each 2 oz., melted, and evaporated with constant stirring.

A Rubefacient and Stimulating plaster.

PIX LIQUIDA (Tar)—From Coniferæ.

A brownish-black, thick, viscid, bituminous liquid, obtained by destructive distillation from the wood of Pinus sylvestris and other pines.

Expectorant. A Stimulating application (when diluted with wax, &c.) to chronic scaly skin affections. (Page 440.)

Unguentum Picis Liquidæ. 5 in 7.

A black ointment, prepared by melting yellow wax 2 oz., and adding tar 5 oz., and stirring while the mixture cools.

PLUMBI ACETAS (Acetate of Lead). $Pb(C_2H_3O_2)_2 3H_2O$.

In white, crystalline, slightly efflorescent masses, obtained by dissolving oxide of lead 24 oz. in acetic acid 2 pints and distilled water 1 pint, with the aid of a gentle heat, filtering, evaporating, and setting aside till crystallisation takes place; known as "sugar of lead."

Sedative and Astringent. Used in internal hæmorrhages.
Dose—1 to 4 grs., in solution or in pill. (Page 441.)

As this salt forms insoluble precipitates, it should not be ordered with iodides, sulphates, or tannates. Used in the preparation of Strychnine.

***Glycerinum Plumbi Subacetatis.** 1 in 6 by weight.

Prepared by boiling, filtering, and evaporating 5 oz. acetate of lead, 3½ oz. oxide of lead, 1 pint glycerine, 12 oz. water.
Astringent and local Sedative.

***Unguentum Glycerini Plumbi Subacetatis.**

See table on the following page.

Pilula Plumbi cum Opio. 3 of lead and ½ of opium in 4.

Prepared by beating into a mass acetate of lead 36 grs., opium 6 grs., confection of roses 6 grs.
Sedative, Narcotic, and Astringent.
Dose—3 to 5 grs.

Suppositoria Plumbi Composita. 3 grs. in each.

Prepared by mixing acetate of lead 36 grs., opium 12 grs., oil of theobroma 132 grs., and dividing into 12 cones.
Anodyne and Astringent. Each contains 1 gr. opium.

Unguentum Plumbi Acetatis. See table on page 257.

Liquor Plumbi Subacetatis. 24 per cent of $Pb_2O(C_2H_3O_2)_2$.

A colourless solution of subacetate of lead in water, prepared by boiling acetate of lead 5 oz. with oxide of lead 3½ oz. in distilled water 1 pint. It is called Goulard's Extract.
Powerfully Astringent, but only used diluted.

Liquor Plumbi Subacetatis Dilutus. 2 drs to 1 pint.

A colourless liquid, often called Goulard's Water, prepared by mixing solution of subacetate of lead and rectified spirit of each 2 drs. with distilled water 19½ oz.
An Astringent and local Sedative.

Plumbi Carbonas. $2PbCO_3$ & $PbOH_2O$.

A soft, heavy, white powder, known as "white lead," of somewhat variable composition; not used internally; externally, mildly Astringent and Sedative.
Used in making Liquor Gutta Percha.
For the Ointment of Carbonate of Lead see the table.

Plumbi Iodidum. PbI_2.

A bright yellow crystalline powder, prepared by mixing solutions of equal quantities of nitrate of lead and iodide of potassium, collecting, washing, and drying the precipitate.
Resolvent and Antiparasitic.

Emplastrum Plumbi Iodidi. 1 in 10.

A bright yellow solid, composed of iodide of lead 2 oz., lead plaster 1 lb., and resin 2 oz.

Alterative and Resolvent to chronic enlargements.

For the Ointment of Iodide of Lead see the table.

Plumbi Nitras. $Pb(NO_3)_2$.

In colourless, opaque, octahedral crystals, prepared by dissolving lead or litharge in nitric acid, and evaporating.

Used only to make the iodide.

Plumbi Oxidum. PbO.

A heavy powder, in brick-red scales, obtained by roasting lead in a current of air; commonly known as Litharge.

Used in making Empl. Saponis Fuscum, Liq. Plumbi Subacetatis, Plumbi Acetas, Glycerinum Plumbi Subacetatis, and the following :—

Emplastrum Plumbi (Diachylon or Litharge Plaster).

A pale-yellow solid, consisting of oleate, palmitate, and stearate of lead, and a little glycerine; it is, chemically speaking, a *soap*. It is prepared by boiling in a steam bath litharge (oxide of lead) 5 lbs., olive oil 10 lbs., and water 5 lbs., for 4 or 5 hours, till a proper consistence is obtained.

A supporting Sedative and Protective application.

It enters into 10 plasters either as lead or resin plaster.

☞ The student should remember that of the 14 official plasters, 11 contain lead. The exceptions are—E. Ammon. c. Hydrarg., E. Cantharidis, and E. Picis.

The following five plasters are often grouped together as the "Lead Plasters":—Plumbi, Plumbi Iodidi, Resinæ, Saponis, and Saponis Fuscum.

The lead is in the form of oleate, palmitate and stearate, but chiefly as oleate. E. Saponis Fuscum contains some acetate of lead.

OINTMENTS OF LEAD.

UNGUENTUM.	COMPOSITION.	COLOUR.
Plumbi Acetatis .. $Pb(C_2H_3O_2)_2,3H_2O$.	Acetate in fine powder 12 grs., benzoated lard 1 oz.	White, 1 in 37½.
Plumbi Carbonatis .. $2PbCO_3$ & $PbOH_2O$.	Carbonate in fine powder 62 grs., simple ointment 1 oz.	Cream, 1 in 8.
Plumbi Iodidi PbI_2.	Iodide in fine powder 62 grs. simple ointment 1 oz.	Orange, 1 in 8.
Glycerini Plumbi Subacetatis $Pb_2O(C_2H_3O_2)_2$.	Glycerine of subacetate 4½ oz., soft paraffin 18 oz., hard paraffin 6 oz.	Cream, 1 in 6⅓.

PODOPHYLLI RHIZOMA (Podophyllum Rhizome)—Ranunculaeeæ.

The brown, wrinkled and knotted, dry rhizome, about the size of a quill, of Podophyllum peltatum. The powder is yellowish-grey. It is sometimes known as Mayapple or Mandrake.

A powerful Cathartie and Stimulant to the liver. (P. 445.)

Dose—10 to 20 grs., in powder, but seldom given in any form but the resin.

Podophylli Resina (Podophyllin, or Resin of Podophyllum).

A pale greenish-brown powder, prepared by pouring a eoncentrated spirituous tineture of podophyllum rhizome into water, when the resin is preeipitated; it is afterwards washed and dried.

Dose—$\frac{1}{4}$ to 1 gr., in pill; generally eombined with aloes, &e.

***Tinctura Podophylli.** 1 gr. in 1 dr.

Prepared by dissolving 160 grs. resin of podophyllum in 1 pint reetified spirit.

Dose—15 minims to 1 dram.

POTASSA CAUSTICA (Caustie Potash). **KHO.**

In hard, white, deliqueseent rods or peneils, prepared by evaporating Liquor Potassæ and pouring the eoneentrated residue into moulds. Soluble in $\frac{1}{2}$ its weight of water.

Aets as a powerful Caustie, extracting the water from the tissues and eausing their death. (Page 448.)

Is eontained in Liquor Potassæ, and is used in making the Permanganate.

Liquor Potassæ. 27 grs. Caustie or Hydrated Potash in 1 oz.

A eolourless solution, prepared by boiling earbonate of potassium 1 lb. with slaked lime 12 oz. and distilled water 1 gallon, when earbonate of calcium is precipitated, and eaustie potash remains in solution.

An Antaeid, and in small doses a gastric Sedative. (P. 449.)

Dose—15 to 60 minims, freely diluted.

Used in making the Bromide and Iodide of Potassium.

Potassa Sulphurata (Sulphurated Potash). K_2S_3 & $K_2S_2O_3$.

A mixture of salts of potassium, in dark-green or liver-coloured, hard, flat fragments, prepared by fusing together earbonate of potassium and sublimed sulphur. Known as liver of sulphur. (Page 487.)

Antiparasitie and Nareotie; seldom given internally.

Dose—3 to 5 grs., swallowed in wafer-paper. (Page 52.)

Unguentum Potassæ Sulphuratæ. 30 grs. to 1 oz.

A dirty-greenish ointment, prepared by mixing sulphurated potash 30 grs.; hard paraffin $\frac{1}{4}$ oz., soft paraffin $\frac{3}{4}$ oz.

Antiparasitic. Used in scabies, &c.

†Potassii Acetas. $KC_2H_3O_2$.

White, foliaceous, satiny, deliquescent masses, prepared by neutralising carbonate of potassium with acetic acid, evaporating to dryness, and liquefying the residue. Soluble in nearly $\frac{1}{3}$ its weight of water.

Diuretic and mildly Cathartic. (Page 450.)

Dose—10 to 60 grs.; as a mild Cathartic 1 to 3 drs.

A safe medicine in the febrile conditions of infancy, given in doses of 1 to 3 grs. to a child 1 year old.

Potassii Bicarbonas. $KHCO_3$.

Colourless, right rhombic, prismatic crystals, obtained by saturating a strong aqueous solution of carbonate of potassium with carbonic acid gas, and recrystallising. Soluble in 3 times its weight of water.

Antacid, Sedative, Diuretic and Antilithic. (Page 453.)

Dose—10 to 40 grs., in solution.

20 grs. are neutralised by 15 grs. of citric or tartaric acid—that is, by $\frac{3}{4}$ of its weight. (See under Acid. Citric.)

Enters into Liquor Magnesii Citratis, and the following :—

Liquor Potassæ Effervescens. 30 grs. to 1 pint.

Potash or Kali water, being a solution of bicarbonate of potassium 30 grs. in 1 pint water, into which carbonic acid gas is driven before corking under a pressure of 4 atmospheres.

Dose—5 to 10 oz.

Potassii Bichromas (Bichromate of Potassium). K_2CrO_4,CrO_3.

In large, red, transparent, four-sided tabular crystals.

Only introduced into the B.P. for the preparation of Sodii Valerianas and Acid. Chromic.

† The student will note the change in the new nomenclature of the potash and soda and other compounds introduced into the new P.B., the terminal "a" now giving place to "ii;" the neuter nouns potassium (-ii), sodium (-ii), &c., being substituted for potassa (-a) and soda (-a), and the English translation potassium and sodium instead of potash and soda

Potassii Bromidum. KBr.

Colourless cubical crystals, obtained by adding bromine to liquor potassæ, which forms a solution of bromide and bromate of potassium. This is evaporated to dryness, and the residue fused with charcoal, which converts the bromate into bromide, which is dissolved out with distilled water, concentrated, and the solution allowed to deposit crystals. (Page 339.)

Hypnotic and Sedative to the nervous system and larynx.

Dose—5 to 30 grs., in solution. Soluble—1 in 2 of water.

Potassii Carbonis. K_2CO_3. 16 per cent. Water of Crystallisation.

A white, crystalline, deliquescent powder, obtained from commercial pearl-ash by washing with its own weight of distilled water, and evaporating the solution so formed to dryness. It is soluble in $\frac{3}{4}$ of its weight of water.

Action and dose similar to the Bicarbonate, only more irritating and Caustic.

It is used in the preparation of

Atropina.	Liquor Potassæ.	Potassii Bicarbonas.
Decoct. Aloes Co.	Mist. Ferri Co.	„ Chloras.
Enema Aloes.	Potassa Sulphurata.	„ Citras.
Liquor Arsenicalis.	Potassii Acetas.	„ Tartras.
		„ Ferrocyanide.

Potassii Chloras. $KClO_3$.

In colourless, rhomboidal, crystalline plates, prepared by passing washed chlorine gas (generated by the action of hydrochloric acid on black oxide of manganese) through a moist mixture of carbonate of potassium and slaked lime. The chlorinated potassium so formed is converted into chlorate by boiling with water, and crystallises out on cooling after evaporation.

Diuretic and Alterative to diseased mucous surfaces. (P. 455.)

Dose—10 to 30 grs., in solution. 1 oz. is easily dissolved in 1 pint water.

It is used in the preparation of Potassii Permanganas, and

Trochisci Potassii Chloratis. 5 grs. in each.

White lozenges, consisting of chlorate of potassium 3,600 grs., sugar 25 oz., gum acacia 1 oz., mucilage of gum acacia 2 oz., distilled water 1 oz., divided into 720 lozenges.

Dose—1 to 6 lozenges.

Potassii Citras. $K_3C_6H_5O_7$.

A white granular powder, prepared by neutralising a solution of citric acid with carbonate of potassium, filtering, and evapo-

rating to dryness with constant stirring till the salt granulates.

A pleasant Refrigerant, Diaphoretic, and mild Laxative.

Dose—20 to 60 grs. in water (in which it is very soluble).

*Potassii Cyanidum. KCN.

In white, opaque deliquescent masses or plates having the odour of hydrocyanic acid, prepared by heating ferrocyanide of potassium at a red heat until gas ceases to be evolved, and pouring off the clear liquid after the sediment subsides in the molten mass.

It is a dangerous poison. Introduced into the P.B. to purify Bismuth.

Potassii Ferrocyanidum or (Potassii Prussias Flava) $K_4FeC_6N_6.3H_2O$.

Large, transparent, yellow crystals, obtained by fusing refuse animal substances with carbonate of potassium in an iron pot, lixiviating the crude product with water, and purifying the salt by crystallisation.

Used only in the preparation of Acidum Hydrocyanicum dilutum and KCN.

Potassii Iodidum. KI.

Colourless cubical crystals, obtained by adding iodine to liquor potassæ, which forms a solution of iodide and iodate. This is evaporated to dryness, the residue pulverised, mixed with charcoal, and fused, and the product dissolved in distilled water, from which it is crystallised by evaporation.

Alterative and Resolvent in syphilis and scrofula. (P. 406.)

Dose—2 to 20 grs. in pill or solution. Soluble in less than its own weight of water.

The following preparations contain this salt in the following quantities per 1 oz. :—

Liniment. Iodi 22 grs.	Tinctura Iodi 11 grs.
Lin. Pot. Iod. cum Sapone 54½ grs.	Unguent. Iodi 16 grs. nearly
Liquor Iodi 33 grs.	Unguent. Potassii Iod. 50 grs.

Linimentum Potassii Iodidi cum Sapone. 1 in 10 by W.

A cream-like substance, prepared by dissolving 2 oz. curd soap in 1 oz. glycerine and 10 oz. water on a water-bath, and triturating the solution with 1½ oz. iodide of potassium and adding 1 dr. of oil of lemon.

Alterative and Resolvent, and does not stain the skin.

Unguentum Potassii Iodidi. 50 grs. in 1 oz., or 1 in $8\frac{3}{4}$.

A white ointment, prepared by dissolving iodide of potassium 61 grs. and carbonate of potassium 4 grs. in distilled water 1 dram, and adding benzoated lard 1 oz.

Acts similarly to the liniment.

Potassii Nitras. KNO_3.

In long, striated, prismatic crystals, or white crystalline masses, being nitrate of potassium of commeree, purified, if neeessary, by crystallisation from solution in distilled water—commonly called nitre or saltpetre. Soluble 1 in 4 of water.

Diuretic, Diaphoretie, and Sedative. (Page 457.)

Dose—10 to 30 grs., in solution.

IN—Argenti et Potassii Nitras.

Potassii Permanganas. $KMnO_4$.

Dark-purple, slender, prismatic crystals, prepared by evaporating to dryness on a sand-bath a solution of caustic potash, to which black oxide of manganese and chlorate of potassium have been added; the resulting green mass of manganate of potassium is fused, boiled in water and saturated with carbonic acid, and concentrated, crystals of permanganate of potassium form in it, which are purified by recrystallisation and dried.

Caustic, Antiseptic, and Deodorant. (Page 458.)

As it destroys all organic substanees and decomposes most inorganic, it should be given only in water (in 16 or 18 parts of which it is soluble), or in pill with Kaolin. (Page 54.)

Liquor Potassii Permanganatis. 1 in 100.

A deep-purple liquid, half the strength of Condy's fluid, prepared by dissolving permanganate of potassium 88 grs. in distilled water 20 oz.

Dose—2 to 4 drs., in distilled water.

Potassii Sulphas. K_2SO_4.

In colourless, very hard, six-sided prisms, terminated by six-sided pyramids.

A mild Cathartie. (Page 459.)

Dose—60 grs. (which are soluble in $1\frac{1}{2}$ oz. of water).

IN—Pil. Colocynth. Co. and Pulv. Ipecac. Co., and their compounds.

Potassii Tartras. $K_2C_4H_4O_6,H_2O$.

Small, colourless, prismatic crystals, prepared from cream of tartar by neutralising it with carbonate of potassium in solution, concentrating, and drying the crystals which form.

A mild Hydragogue Cathartic and Diuretic. (Page 450.)

Dose—60 grs. to $\frac{1}{2}$ oz., in solution. Dissolves in its own weight of water.

Potassii Tartras Acida. $KHC_4H_4O_6$.

Bitartrate or acid tartrate of potassium, or cream of tartar, in a gritty, white powder, obtained from the crude tartar which

is deposited during the fermentation of grape juice and from the lees of wine.

A Hydragogue Cathartic and Diuretic. (Page 452.)

Dose—20 to 60 grs. As a purgative, ½ to 1 oz. (1 pint of water only dissolves about 50 grs.) It is elegantly administered with twice its bulk of orange marmalade.

It enters into the preparation of Tartaric Acid, Tartar Emetic, Confection of Sulphur, Compound Jalap Powder, Tartrates of Iron, Potassium, and Soda.

PRUNUM (Prune)—Rosaceæ.

The oblong, black, shrivelled, dried drupe of Prunus domestica. Imported from the South of France.

A mild Laxative, entering into Confectio Sennæ. (P. 459.)

PTEROCARPI LIGNUM (Leguminosæ).

Red Sandal-Wood. Dense, heavy, dark, reddish-brown billets, raspings, or chips of the heart-wood of Pterocarpus santalinus. The powder is blood-red.

Used only for colouring Tinct. Lavandulæ Co. (Page 459.)

PYRETHRI RADIX (Pellitory Root)—Compositæ.

The dried root of Anacyclus Pyrethrum, in pieces about the size of the little finger, with brown bark studded with black points. Easily recognised by the prickling sensation when chewed. (Page 459.)

Powerful Sialagogue, greatly increasing the flow of saliva.

Tinctura Pyrethri. 4 oz. to 1 pint.

A dark sherry-coloured liquid, prepared by macerating and percolating pellitory root 4 oz. with rectified spirit 1 pint.

Used locally to promote the flow of saliva.

PYROXYLIN (Gun Cotton).

Resembling cotton wool in appearance, and prepared by mixing sulphuric and nitric acids 5 oz. each, and immersing cotton wool 1 oz. in the mixture for 3 minutes, transferring it to a vessel containing water, in which it is to be thoroughly washed, and dried in a water bath.

Enters into Collodium, Collodium Flexile, and Collodium Vesicans.

QUASSIÆ LIGNUM (Quassia Wood)—Simarubaceæ.

The yellowish-white shavings, chips, or raspings or large dense billets of Picræna excelsa (Quassia excelsa).

Bitter Tonic without Astringency; and, as it contains no tannin, it can be ordered with iron preparations. (Page 460.)

Extractum Quassiæ.

A black extract, prepared by evaporating a cold infusion of the wood. (Nearly 50 times the strength of the wood.)

Dose—3 to 5 grs., in pill.

Infusum Quassiæ. 55 grs. to 10 oz.—cold ($\frac{1}{2}$ hour).

Prepared by infusing quassia chips 55 grs. in *cold* distilled water 10 oz.

Dose—1 to 2 oz.

Tinctura Quassiæ. $\frac{3}{4}$ oz. to 1 pint.

A straw-coloured liquid, prepared by *macerating* quassia chips $\frac{3}{4}$ oz. in proof spirit 1 pint for 7 days.

Dose—$\frac{1}{2}$ to 2 drams.

QUERCUS CORTEX (Oak Bark)—Cupuliferæ.

The dried bark, with shining grey epidermis and brown interior, of the small branches and young stems of the British oak—Quercus Robur (Q. pedunculata). Collected in spring.

Astringent—containing tannic and gallic acids.

Dose—$\frac{1}{2}$ to 2 drs. of the powder.

Decoctum Quercus. $1\frac{1}{4}$ oz. to 1 pint, or 1 in 16.

Prepared by boiling for ten minutes, oak bark (bruised) $1\frac{1}{4}$ oz., distilled water 1 pint, and making the strained product to measure a pint.

Dose—1 to 2 oz. (Should not be ordered with iron.)

***QUININÆ HYDROCHLORAS.** $C_{20}H_{24}N_2O_2HCl,2H_2O$.

Hydrochlorate of quinine. In crystals slightly larger than those of sulphate of quinine, obtained from the same source and the same process, the separated alkaloid being neutralised by hydrochloric acid.

Dose, action, and method of administration same as the sulphate. (Page 365.)

Tinctura Quininæ. 160 grs. *hydrochlorate* to 1 pint.

Hydrochlorate of quinine 160 grs. dissolved in 1 pint tincture of orange-peel. Contains 1 gr. in 1 dram.

Dose—$\frac{1}{2}$ to 2 drams.

QUININÆ SULPHAS $((C_{20}H_{24}N_2O_2)_2H_2SO_4)_215H_2O$.

Sulphate of quinine in filiform, silky, snow-white crystals, prepared from various kinds of powdered Cinchona and Remijia bark, by extraction with spirit after the addition of lime, or by the action of alkalies on an acidulated aqueous infusion,

with subsequent neutralisation of the alkaloid by sulphuric acid, and purification of the resulting salt. It should not contain much more than 5 per cent. of sulphates of other cinchona alkaloids.

Tonic, Antiperiodic, and Antipyretic. (Page 365.)

Dose—1 to 10 grs., in pill, powder, or solution.

Tinctura Quininæ Ammoniata. 160 grs. *sulphate* to 1 pint.

A colourless liquid, prepared by dissolving sulphate of quinine 160 grs. in solution of ammonia 2½ oz. and proof spirit 17½ oz. Contains 1 gr. in 1 dram.

Dose—½ to 2 drs., freely diluted.

Vinum Quininæ. 1 gr. in 1 oz.

A golden, sherry-coloured liquid, prepared by dissolving sulphate of quinine 20 grs. in orange wine 1 pint, to which citric acid 30 grs. have been added.

Dose—½ to 1 oz.

Ferri et Quininæ Citras. 6 grs. contain 1 gr. quinine. (See under Ferrum, page 219.)

RESINA (Resin)—From Coniferæ.

The residue left after the distillation of the oil of turpentine from the crude oleo-resin (turpentine) of various species of Pinus, in translucent, yellowish, compact, brittle, shining masses. (Page 461.)

Used chiefly for its adhesive qualities in 8 plasters; it also enters into Ungt. Resinæ, Ungt. Terebr., and Charta Epispastica.

Emplastrum Resinæ. 1 in 9½.

A pale-yellow solid, prepared by melting together resin 4 oz., lead plaster 32 oz., and curd soap 2 oz.

It enters into 3 plasters.

Unguentum Resinæ. 1 in 4 nearly.

A yellowish-brown, stiff ointment, prepared by melting together resin 8 oz., yellow wax 4 oz., simple ointment 16 oz., and almond oil 2 oz. Often called basilicon ointment.

A good stimulating application to indolent ulcers.

***RHAMNI FRANGULÆ CORTEX** (Frangula Bark)—Rhamnaceæ.

The dried bark, *collected at least one year before use*, from the young trunks and branches of Rhamnus Frangula, about

$\frac{1}{25}$ inch thick, in small quills, and covered with *a brown, corky layer marked with white lenticels.*

Laxative and Cathartic. (Page 461.)

*Extractum Rhamni Frangulæ.

A semi-solid extract, prepared by exhausting a tincture of frangula bark, and evaporating.

Dose—15 to 60 grs.

*Extractum Rhamni Frangulæ Liquidum. 1 in 1.

A dark liquid, prepared by evaporating a decoction of 1 lb. frangula bark to 12 oz. and adding 4 oz. rectified spirit.

Dose—1 to 4 drams.

*RHAMNI PURSHIANI CORTEX—Rhamnaceæ. (Cascara Sagrada or Sacred Bark).

The dried bark of Rhamnus Purshianus, about $\frac{1}{25}$ inch to $\frac{1}{8}$ inch thick, in quills, covered with a *greyish-white, easily removable layer, and spotted with lichens.*

Cathartic and Stimulant to the entire intestinal glandular apparatus. (Page 355.)

*Extractum Cascaræ Sagradæ.

A semi-solid extract, prepared by exhausting cascara sagrada by percolating with proof spirit and water, and evaporating the resulting liquid.

Dose—2 to 8 grs., in pill.

*Extractum Cascaræ Sagradæ Liquidum.

An almost black liquid, prepared by boiling 1 lb. of cascara sagrada in distilled water q.s., evaporating the decoction to 12 oz., and adding 4 oz. rectified spirit.

Cathartic, Tonic, and Cholagogue.

Dose—$\frac{1}{2}$ to 2 drams.

RHEI RADIX (Rhubarb Root)—Polygonaceæ.

The root, deprived of its bark, sliced and dried, of Rheum palmatum and R. officinale, and probably other species, from China and Thibet. In hard, compact, yellow irregularly rounded pieces bored with a hole, with a marbled fracture exhibiting starlike spots.

Stomachic, Tonic, and Cathartic. (Page 461.)

Dose—5 to 20 grs., in wafer paper. 3 grs. for a child 1 year old.

Extractum Rhei.

A brown elastic extract, prepared by exhausting rhubarb root with proof spirit and water, and evaporating on a water bath the tincture so produced.

Dose—5 to 15 grs.

Infusum Rhei. ¼ oz. to 10 oz. (½ hour).

¼ oz. rhubarb root sliced infused in 10 oz. boiling water.

Dose—1 to 2 oz.

Pilula Rhei Composita. 1 in 4 nearly.

Prepared by beating together rhubarb root 3 oz., Socotrine aloes 2¼ oz., myrrh and hard soap of each 1½ oz., oil of peppermint 1½ drs., glycerine 1 oz., treacle 3 oz.

Dose—5 to 10 grs.

Pulvis Rhei Compositus. 1 in 4½.

A pale yellow powder, turning red when moistened, prepared by rubbing together rhubarb root 2 oz., light or heavy magnesia 6 oz., ginger 1 oz. Known as Gregory's Powder.

Antacid, Stomachic, and Cathartic.

Dose—20 to 60 grs., in milk; for a child 1 year old, 5 grs.

Syrupus Rhei. 1 in 15.

A brown thick liquid, prepared by exhausting 2 oz. each rhubarb root and coriander fruit with distilled water 24 oz. and rectified spirit 8 oz., evaporating to 14 oz., adding 24 oz. sugar, and dissolving with gentle heat.

Dose—1 to 4 drs.; ½ dram for a child 1 year old.

Tinctura Rhei. 2 oz. to 1 pint.

A dark-brown liquid, prepared by macerating and percolating with proof spirit 1 pint, rhubarb root 2 oz., cardamoms freed from their pericarps, coriander, and saffron of each ¼ oz.

Dose—1 to 2 drs. as a Stomachic; ½ to 1 oz. as a Purgative.

Vinum Rhei. 1½ oz. to 1 pint.

A brown liquid, prepared by *macerating* rhubarb root 1½ oz. and canella bark 60 grs. in sherry 1 pint for 7 days.

Dose—1 to 2 drs.

RHŒADOS PETALA (Red Poppy Petals)—Papaveraceæ.

The fresh, scarlet-coloured petals of Papaver Rhœas, from British plants.

Sedative and Anodyne, but so feeble that they may be regarded as colouring agents only. (Page 463.)

Syrupus Rhœados. 1 in $3\frac{1}{2}$.

A rich red syrup, prepared by making an infusion of 13 oz. fresh red poppy petals with distilled water one pint, in a water-bath, and in this dissolving sugar $2\frac{1}{4}$ lb., and adding rectified spirit $2\frac{1}{2}$ oz.

Dose—1 dram.

RICINI OLEUM (Castor Oil)—From Euphorbiaceæ.

The viscid, almost odourless and colourless oil expressed from the seeds of Ricinus communis.

A Cathartic, causing loose motions without being Hydragogue.

Dose—1 dr. to 1 oz. For a child 1 year old 1 dr. (P. 463.)

Enters into Collodium Flexile, Linimentum Sinapis Co., and Pil. Hydrarg. Subchlor. Co.

ROSÆ CANINÆ FRUCTUS (Hips)—Rosaceæ.

The shining, ovate, scarlet, ripe fruit of the Dog rose, Rosa canina, and other indigenous allied species.

Feebly Astringent; chiefly used as a vehicle. (Page 465.)

Confectio Rosæ Caninæ. 1 in 3. (Confection of Hips).

A soft brownish mass, prepared by beating to a pulp 1 lb. of seedless hips, sifting, and adding twice their weight of sugar.

$\frac{1}{2}$ to 4 drams may be taken for a dose.

ROSÆ CENTIFOLIÆ PETALA (Cabbage-Rose Petals)—Rosaceæ.

The fresh fully-expanded petals of the Rosa centifolia. Grown in Britain.

Though slightly Laxative, it is introduced for its odour.

Aqua Rosæ. 10 lb. to 1 gallon, or 1 in 1.

The colourless fragrant water distilled from the fresh petals of the cabbage-rose—10 lb. (or an equivalent of the dried petals preserved with salt) mixed with water 5 gallons, from which is to be distilled 1 gallon.

A vehicle for nauseous medicines, and an agreeable basis for lotions, gargles, eyewashes, &c. (Page 465.)

Enters into Mist. Ferri Co. and Trochisci Bismuthi.

ROSÆ GALLICÆ PETALA (Red Rose Petals)—Rosaceæ.

The purplish-red, unexpanded, velvety petals, fresh and dried, of Rosa gallica. Grown in Britain.

Astringent; chiefly used on account of their colouring.

Confectio Rosæ Gallicæ. 1 in 4. (Confection of Roses).

A soft, violet mass, prepared by beating *fresh* red rose petals 1 lb. with sugar 3 lbs.

Used as a basis for pill masses.

It enters into 4 pills bearing the name of Aloes, into Carbonate of Iron pill, Blue pill, and Lead and Opium pill.

Infusum Rosæ Acidum. ¼ oz. to 10 oz. (½ hour).

A bright red liquid, prepared by infusing *dried* red rose petals ¼ oz. in boiling distilled water 10 oz. and diluted sulphuric acid 1 dram.

Dose—1 to 2 oz. Makes a good basis for gargles, and is mildly Astringent.

Syrupus Rosæ Gallicæ. 1 in 17.

A red syrup, prepared from 2 oz. *dried* red rose petals by making an infusion with 1 pint boiling distilled water (for 2 hours), squeezing through calico, heating to the boiling point, filtering, adding 30 oz. sugar, and dissolving with gentle heat.

Dose—1 dram. Chiefly used for its bright red colour.

ROSMARINI OLEUM (Oil of Rosemary)—From Labiatæ.

The colourless or pale yellow oil distilled from the flowering tops of Rosmarinus officinalis.

Stimulant and externally Rubefacient. (Page 466.)

Dose—1 to 4 minims, on sugar or in pill.

It enters into Liniment. Saponis and Tr. Lavand. Co., and the following—

Spiritus Rosmarini. 1 in 50.

A colourless liquid, consisting of oil of rosemary 1 oz. dissolved in 49 oz. rectified spirit.

Dose—½ to 1 dram, diluted.

RUTÆ OLEUM (Oil of Rue)—Rutaceæ.

The pale-yellow oil distilled from the fresh herb of Ruta graveolens.

Stimulant, Antispasmodic, Emmenagogue, and Rubefacient.

Dose—1 to 4 minims, in emulsion.

SABADILLA (Cevadilla)—Melanthaceæ.

The dried, scimitar-shaped, wrinkled, dark-brown shining seeds of Schœnocaulon officinale (Asagræa officinalis), *without* their pericarps.

A powerful Emetic, Cathartic, and Anthelmintic. (P. 467.)

Dose—3 to 5 grs. Only used to make Veratrine.

SABINÆ CACUMINA (Savin Tops)—Coniferæ.

The fresh and dried tops of Juniperus Sabina. Twigs covered with minute imbricated leaves in 4 rows. Collected in spring from British plants.

Emmenagogue, Anthelmintic, Diaphoretic. (Page 468.)

Dose—4 to 10 grs., in powder.

Oleum Sabinæ.

The colourless or pale-yellow oil distilled in Britain from fresh savin tops.

Dose—1 to 4 minims, on sugar or in emulsion.

Tinctura Sabinæ. 2½ oz. to 1 pint.

A brownish liquid, prepared by macerating and percolating dried savin tops 2½ oz. with proof spirit 1 pint.

Dose—20 minims to 1 dram.

Unguentum Sabinæ. 8 to 19.

A green ointment, prepared by digesting fresh savin tops 8 oz. in a melted mixture of yellow wax 3 oz. and benzoated lard 16 oz. on a water-bath, and expressing through calico.

Used to keep blistered surfaces from healing.

SACCHARUM LACTIS (Sugar of Milk). $C_{12}H_{24}O_{12}$.

In white cylindrical masses or fragments of cakes, obtained from the whey of milk by evaporation.

Nutritive, and Sedative to the stomach, but generally used to dilute powders, as in Pulvis Elaterini Co. (Page 469.)

Dose—1 to 4 drs. or more, in water or milk.

SACCCHARUM PURIFICATUM. $C_{12}H_{22}O_{11}$.

Refined Sugar or Sucrose, in compact crystalline masses.

Demulcent, but chiefly used for its sweetening properties.

It enters into all the syrups and lozenges, most of the confections, some mixtures, pills, and powders, in Ferri Carb. Saccharata, Liq. Calcis. Sac., Ext. Sarsæ Liq., and Sodii Citro-Tart. Effervese.

Syrupus. 5 lbs. to 2½ lbs., or 1 in 1⅛.

A thick colourless liquid, prepared by dissolving sugar 5 lbs. in distilled water 2½ lbs. Its specific gravity is 1·330, which is about the average density of the syrups.

It enters into chalk and creasote mixtures, compound pill of gamboge, 3 syrups, 2 confections, and Tr. Chlorof. et Morph.

***SALICINUM** (Salicin). $C_{13}H_{18}O_7$—Salicaceæ.

A crystalline glucoside, in small, shining, colourless crystals, obtained by treating the bark of Salix alba and other species

of Salix and of Populus with hot water, removing tannin and colour from the decoction, evaporating, purifying and recrystallising.

Acts like Acidum and Sodii Salicylas, which see. (P. 310.)

Dose—3 to 20 grs., dissolved in 1 oz. water.

SAMBUCI FLORES (Elder Flowers)—Caprifoliaceæ.

The small white flowers in corymbose cymes of Sambucus nigra, from indigenous plants.

Seldom employed, except as a Cosmetic to remove freckles.

Aqua Sambuci. 1 in 1 (same strength as Aq. Rosæ).

A colourless water, prepared by mixing fresh elder flowers 10 lbs. with water 5 gallons, and distilling 1 gallon. May be made with an equivalent quantity of the preserved flowers.

A fragrant basis for skin lotions.

***SANTALI OLEUM** (Oil of Sandal wood, or Oleum Santali Flavi)—Santalaceæ.

The thick, pale-yellow aromatic oil distilled from the wood of Santalum album.

Diuretic; action similar to Copaiba. (Page 469.)

Dose—10 to 30 minims, in capsules or emulsion.

SANTONICA (Santonica)—Compositæ.

The pale, greenish-brown, smooth, minute, unexpanded flower-heads of Artemisia Maritima, var. Stechmanniana (Artemisia pauciflora).

Anthelmintic. (Page 469.)

Dose—10 to 60 grs., but generally given in the form of

SANTONINUM (Santonin). $C_{15}H_{18}O_3$.

The active principle of santonica; in minute, colourless, flat, and rhombic prisms, becoming yellow on exposure to light. Prepared by an intricate process, of which the following is an outline:—

(a.) Santonica is boiled with slaked lime and water, which forms a solution of santonate of lime. *(b.)* This liquid is concentrated by evaporation, and hydrochloric acid added to precipitate the santonin. *(c.)* The precipitate, after washing with water and ammonia, is dissolved in boiling spirit, to which charcoal is added; it is filtered, and crystals form on cooling. *(d.)* These crystals are again dissolved in boiling spirit, and allowed to crystallise out on cooling. They are finally dried on filtering paper. No light should reach the crystals during the process.

Anthelmintic—killing the round and thread worm. (P. 469.)

Dose—For an adult, 2 to 6 grs.; for a child 1 year, ½ to ¾ gr.; for a child 2 or 3 years old, 2 grs.; and above 4 years, 3 grs.

It should, if possible, always be given in a teaspoonful of castor oil, which greatly increases its efficacy and safety.

***Trochisci Santonini** (1 gr. in each).

White or yellowish-white lozenges, 720 of which contain 720 grs. Santonin, 25 oz. sugar, 1 oz. gum acacia, 2 oz. mucilage of acacia and water q.s.

SAPO ANIMALIS (Curd Soap).

The white, or greyish-white, horny, and brittle soap made with soda and a purified animal fat, consisting principally of stearin. (Page 471.)

Mildly Laxative, but chifly used for its physical qualities.

IN—Emp. Resinæ, Saponis, and Saponis Fuscum, Ext. Col. Co. Lin. Pot. Iod. C. Sapone Pil. Scammonii Co., Pil. Phosph. and Suppositoria Acid Tannic., Carbolic, and Morphinæ cum Sapone.

Emplastrum Saponis. 1 of soap in 7.

A white solid, prepared by melting curd soap 6 oz., resin 1 oz., and lead plaster 2¼ lbs., stirring and evaporating.

A useful Strapping for swelled joints, acts mechanically.

Enters into Empl. Calefaciens.

Emplastrum Saponis Fuscum (Brown Soap Plaster). 1 in 6.

A brownish solid, prepared by heating oxide of lead 15 oz. with vinegar 1 gallon till the oxide combines with the acid, then adding curd soap 10 oz., heating again till the moisture is evaporated, adding yellow wax 12½ oz. and olive oil 20 oz., and evaporating to a proper consistence. It contains oleate of lead. (See p. 257.)

Sapo Durus (Hard or White Castile Soap).

The dry, greyish-white soap in appearance resembling curd soap, but made with olive oil and soda. It is an oleate of soda.

Antacid and Laxative. (Page 471.)

Dose—5 to 15 grs., in pill.

Enters into 7 pill masses, and

Linimentum Saponis. 1 in 12.

A clear, straw-coloured liquid, prepared by macerating for 7 days hard soap 2 oz., camphor 1 oz., and oil of rosemary 3 drs., in rectified spirit 16 oz., diluted with distilled water 4 oz.

A Stimulating application to bruises and sprains; known as "Opodeldoc."

Enters into Linimentum Opii.

Pilula Saponis Composita (or Pil. Opii). 1 gr. opium in 6.

Prepared by beating together powdered opium ½ oz., hard soap 2 oz., glycerine, q.s.

Narcotic. The name Pil. Saponis Co. is used to disguise its composition.

Dose—3 to 5 grs.

Sapo Mollis (Soft Soap).

The yellowish-green, inodorous jelly, made with olive oil and potash, being an oleate of potassium.

Used in making turpentine liniment.

SARSÆ RADIX (Jamaica Sarsaparilla)—Smilaceæ.

The dried, long, slender, reddish-brown root, covered with rootlets, of Smilax officinalis, formerly imported from Central America by way of Jamaica.

An Alterative, Tonic, and Diaphoretic. (Page 472.)

Dose—½ to 2 drs., in powder.

Decoctum Sarsæ. 2½ oz. to 1 pint.

Prepared by digesting sarsaparilla root 2½ oz. in boiling distilled water 1½ pint for 1 hour, then boiling for 10 minutes, and making the strained product measure 1 pint.

Dose—2 to 10 oz.

Decoctum Sarsæ Compositum. 2½ oz. to 1 pint.

Prepared by digesting for 1 hour in 1½ pint boiling distilled water, sarsaparilla root 2½ oz., sassafras, guaiacum, dried liquorice of each ½ oz., mezereon bark ⅛ oz., boiling for 10 minutes, and making the strained product measure 1 pint.

Dose—2 to 10 oz.

Extractum Sarsæ Liquidum. 1 in 1.

A deep coffee-brown liquid, prepared by exhausting 40 oz. sarsaparilla with 10 oz. spirit and pressing out 20 oz., macerating the marc at 160°, with 12 pints water, straining, adding 5 oz. sugar, evaporating, and adding the 20 oz. spirituous extract, so that the product measures 40 oz.

Dose—2 to 4 drams.

SASSAFRAS RADIX (Sassafras Root)—Lauraceæ.

The dried, brown, branched root of Sassafras officinale, in pieces covered with rusty brown bark, also in chips.

Diaphoretic. Used only to flavour Decoctum Sarsæ Co. P. 472.

SCAMMONIÆ RADIX (Convolvulaceæ).

Scammony Root. The dried, hard, tap-shaped roots, brown without, white within, of Convolvulus Scammonia.

A griping Cathartic. (Page 472.)

Only used for making the following :—

Scammoniæ Resina (Resin of Scammony).

The brownish, translucent, brittle, resinous solid, prepared by exhausting scammony root with rectified spirit, adding water (which throws down the resin), and then distilling off the spirit and drying and washing the residue. It may be similarly prepared from scammony.

Dose—3 to 8 grs., in pill or powder, or rubbed up with milk.

It enters into Pil. and Extract. Colocynth. Co., and the following :—

Confectio Scammonii. 1 in 3.

A brownish, soft mass, prepared by mixing scammony resin 6 oz., ginger 3 oz. (both in fine powder), oil of caraway 2 drs., oil of cloves 1 dram, syrup 6 oz., and honey 3 oz.

Dose—10 to 30 grs.

Pilula Scammonii Composita. 1 in 3 nearly.

Prepared by dissolving resins of scammony and jalap of each 1 oz., curd soap 1 oz., in strong tincture of ginger 1 oz., and rectified spirit 2 oz., and evaporating to a proper consistence.

An energetic Cathartic.

Dose—5 to 15 grs.

Pulvis Scammonii Compositus. 1 in 2.

A brown powder, prepared by mixing and sifting scammony resin 4 oz., jalap 3 oz., ginger 1 oz.

An active Hydragogue Cathartic.

Dose—10 to 20 grs. 1 to 2 grs. for a child 1 year old.

SCAMMONIUM (Scammony).

A gum resin, obtained by incising the *living* root of Convolvulus Scammonia, in ash-grey and rough, cinder-like irregular fragments, with a black, shining, splintery, resinous fracture.

A powerful Cathartic. (Page 472.)

Dose—5 to 10 grs., in powder, pill, or emulsion.

Mistura Scammonii. 3 grs. to 1 oz.

An emulsion of 6 grs. scammony and 2 oz. milk.

Dose—1 to 3 oz. For a child 1 year old, 1 to 2 drs.

SCILLA (Squill or Sea Onion)—Liliaceæ.

The dried, sliced, pear-shaped bulb or underground stem of Urginea Scilla, divested of its outer scales; in dried, yellowish-white, tough, curved, dampish fragments.

Diuretic, Expectorant, and Emetic. (Page 473.)

Dose—1 to 3 grs. of the powder.

Acetum Scillæ. 2½ oz. to 1 pint nearly.

A pale straw-coloured liquid, prepared by macerating squill 2½ oz. in dilute acetic acid 1 pint for 7 days.

Dose—15 to 40 minims; generally given as Syr. Scillæ.

Oxymel Scillæ.

A thick, opalescent, brownish liquid, composed of vinegar of squill 1 pint, clarified honey 2 lbs., mixed and evaporated till the density of 1·32 is reached.

Dose—½ to 1 dram as an Expectorant.

Pilula Scillæ Composita. 1 in 5.

Prepared by mixing and beating into a uniform mass squill 1¼ oz.; ginger, ammoniacum, and hard soap, of each (in fine powder) 1 oz., treacle 2 oz. or q.s.

Dose—5 to 10 grs., as an Expectorant or Diuretic.

Syrupus Scillæ. 1 of squill in 17.

A thick straw-coloured liquid, prepared by dissolving sugar 2½ lb. in vinegar of squill 1 pint.

Dose—½ to 1 dram as an Expectorant; 1 oz. as an Emetic.

For a child 1 year old, as an Expectorant, 5 mins.; as an Emetic, ½ to 1 dram.

As it contains acetic acid, it should not be ordered with alkalies. It is sometimes ordered by mistake with Spt. Ammon. Aromat.

Tinctura Scillæ. 2½ oz. to 1 pint.

A straw-coloured liquid, prepared by macerating and percolating bruised squill 2½ oz. with proof spirit 1 pint.

Dose—10 to 30 minims.

Pilula Ipecacuanhæ cum Scilla. (*Vide* Ipecacuanha.)

It contains 1 of opium, 1 of ipecacuanha, 3¼ of squill, and 3¼ of ammoniacum in 23½ parts.

SCOPARII CACUMINA (Broom Tops)—Leguminosæ.

The fresh and dried tops, with their straight, angular, dark-green, smooth twigs, of Cytisus scoparius (Sarothamnus scoparius), from indigenous plants.

Diuretic; in large dose, Cathartic. (Page 474.)

Decoctum Scoparii. 1 oz. (*dried*) to 1 pint.

Prepared by boiling for 10 minutes dried broom tops 1 oz. in water 1 pint, and making the strained product measure 1 pint.

Dose—2 to 4 oz.

Succus Scoparii.

The brown juice obtained by bruising fresh broom tops in a stone mortar and adding to every 3 measures of the fresh juice 1 measure of rectified spirit, setting aside and filtering.

Dose—1 to 2 drs.

SENEGÆ RADIX (Senega Root)—Polygalaceæ.

The dried, yellowish-brown, contorted root, of Polygala Senega, about the size of a quill, with a keel along its whole extent.

A Stimulating Expectorant and Emetic. (Page 475.)

Infusum Senegæ. ½ oz to ½ pint (½ hour.)

Prepared by infusing senega root in No. 20 powder ½ oz., in boiling distilled water ½ pint.

Dose—1 to 2 oz. Used as a basis for cough mixtures.

Tinctura Senegæ. 2½ oz. to 1 pint.

A brown, sherry-coloured liquid, prepared by macerating and percolating senega root 2½ oz. in No. 40 powder with proof spirit 1 pint.

Dose—½ to 2 drs.

SENNA ALEXANDRINA (Alexandrian Senna)—Leguminosæ.

The greyish-green, lanceolate, acute leaflets, about one inch long, and unequally divided at the base, of Cassia acutifolia (Cassia lanceolata), from Alexandria. They should be carefully freed from Argel leaves, which are bitter, and have not an unequal oblique base.

Cathartic. (Page 476).

Dose—10 to 30 grs., in powder.

SENNA INDICA (Tinnivelly Senna)—Leguminosæ.

The green, lanceolate, acute leaflets of Cassia angustifolia (Cassia elongata), from one to two inches long, with unequal and oblique base. From Southern India, and imported pure. It is also called East Indian Senna. (B.P. 1885.)

May be used instead of Alexandrian senna (which it resembles in dose and action), to make any of the following preparations :—

Confectio Sennæ. 1 in 11.

A soft blackish mass, composed of powdered senna 7 oz., powdered coriander 3 oz., figs 12 oz., tamarind 9 oz., cassia

pulp 9 oz., prunes 6 oz., extract of liquorice 1 oz., sugar 30 oz., distilled water 24 oz. or q.s.; prepared by boiling the figs and prunes in the water, adding the tamarind and cassia, rubbing the pulp through a sieve, in this dissolving the sugar and extract of liquorice and adding the powders, making the weight up to 75 oz. with distilled water. Called "Lenitive electuary."

A mild Cathartic, and in smaller doses Laxative.

Dose—1 to 2 drs.

Infusum Sennæ. 1 oz. to 10 ($\frac{1}{2}$ hour).

Prepared by infusing senna 1 oz., and ginger 28 grs., in boiling distilled water 10 oz.

Dose—1 to 2 oz.

Enters into Mist. Sennæ Co.

Mistura Sennæ Composita. 1 of $MgSO_4$ in 5.

An almost black liquid, often known as "Black draught," consisting of sulphate of magnesium 4 oz., liquid extract of liquorice 1 oz., tincture of senna $2\frac{1}{2}$ oz., compound tincture of cardamoms $1\frac{1}{2}$ oz., infusion of senna 15 oz.

A valuable Hydragogue Cathartic.

Dose—1 to $1\frac{1}{2}$ oz.

Syrupus Sennæ. 1 in 2.

A deep reddish-brown liquid, prepared by making an infusion of 1 lb. of senna with 5 pints of distilled water at 120°, evaporating to 10 oz., adding 3 oz. rectified spirit in which are dissolved 3 minims oil of coriander; filtering, making the product measure 16 oz. by the addition of distilled water; in this dissolve 24 oz. sugar.

A mild Cathartic.

Dose—1 to 4 drams; a child 1 year old may get $\frac{1}{2}$ to 1 dram.

Tinctura Sennæ. $2\frac{1}{2}$ oz. to 1 pint.

An almost black liquid, prepared by macerating and percolating with 1 pint of proof spirit the following:—senna $2\frac{1}{2}$ oz., raisins freed from seeds 2 oz., caraway and coriander of each $\frac{1}{2}$ oz.

Dose—1 to 4 drs.

Enters into Mist. Sennæ Co.

Pulvis Glycyrrhizæ Compositus. 1 of senna in 6. (See Glycyrrhiza.)

SERPENTARIÆ RHIZOMA (Serpentary Rhizome)—Aristolochiaceæ.

A small, round, knotty, yellowish-white, dried rhizome, with numerous slender rootlets, of Aristolochia Serpentaria or of A.

reticulata. The rhizome of the latter is a little thicker and rootlets larger and less matted. (See under Valerian.)

An Aromatic Tonic and Diaphoretic. (Page 477.)

Dose—10 to 15 grs., in powder, but seldom used in this form.

It enters into Tinct. Cinchonæ Co., and the following :—

Infusum Serpentariæ. $\frac{1}{4}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

Prepared by infusing serpentary rhizome $\frac{1}{4}$ oz. in boiling distilled water 10 oz.

Dose—1 to 2 oz.

Tinctura Serpentariæ. $2\frac{1}{2}$ oz. to 1 pint.

A brown liquid, prepared by percolating and maecrating serpentary in No. 40 powder $2\frac{1}{2}$ oz. with proof spirit 1 pint.

Dose—$\frac{1}{2}$ to 2 drams.

SEVUM PRÆPARATUM (Prepared Suet).

The white, smooth, internal fat of the abdomen of the sheep --Ovis Aries—purified by melting and straining.

Used to give proper consistence to Empl. Cantharidis and Ungt. Hydrarg.

SINAPIS (Mustard)—Cruciferæ.

Black and white mustard seeds, powdered and mixed, forming a greenish-yellow aerid powder.

Emetic and stimulant. Externally—Rubefacient. (P. 477.)

Sinapis Albæ Semina.

The hard, round, pale yellow, finely pitted, dried, ripe seeds (1 line in diameter) of Brassica alba (Sinapis alba) from British plants.

Sinapis Nigræ Semina.

The dark-reddish, round, hard, dried, ripe seeds ($\frac{1}{2}$ a line in diameter) of Brassica nigra (Sinapis nigra) from British plants.

Cataplasma Sinapis. $2\frac{1}{2}$ oz. in 15 oz.

Composed of linseed meal $2\frac{1}{2}$ oz., mixed gradually with boiling water 8 oz., to which is added mustard $2\frac{1}{2}$ oz. previously mixed with 2 oz. lukewarm water.

Charta Sinapis. 1 in 3.

Prepared by mixing mustard 1 oz. with solution of gutta percha 2 oz., and coating over with the semi-fluid mixture one surface of strips of cartridge paper. Before being applied to the skin, they should be dipped for a few seconds into tepid water.

Rubefacient, and, if applied long enough, Vesicant.

Oleum Sinapis.

The pale-yellow pungent oil distilled with water from the seeds of *Black* mustard after the expression of the fixed oil. Sinks in water.

A powerful Irritant, producing instant Vesication.

Linimentum Sinapis Compositum. 1 in 40.

A deep green liquid, prepared by adding oil of mustard 1 dram to castor oil 5 drs., and adding the mixture to ethereal extract of mezereon 40 grs. and camphor 120 grs., dissolved in rectified spirit 4 oz.

A Stimulating and Rubefaeient application.

SODA CAUSTICA (Caustic Soda). NaHO.

Hydrate of Sodium with some impurities. In hard greyish-white fragments or sticks, prepared by rapidly boiling down solution of soda in a silver or clean iron vessel until an oily fluid consistence is reached, when it is poured out or run into moulds and allowed to solidify, and preserved in stoppered green glass bottles.

Powerfully Corrosive and Alkaline. (Page 479.)

It is contained in the following :—

Liquor Sodæ. 18·8 grs in 1 oz.

A colourless liquid, prepared by boiling carbonate of sodium 28 oz. with distilled water 1 gallon, and gradually adding slaked lime 12 oz., and continuing the ebullition 10 minutes, when carbonate of lime falls to the bottom, and caustic soda remains in solution.

Antacid—in 20 minim doses. Seldom given internally.

Soda Tartarata. $NaKC_4H_4O_6,4H_2O$,

Or Tartarated Soda and Potash, in colourless transparent prisms, soluble in twice their weight of water, and, when powdered, commonly known as Rochelle Salt, prepared by adding cream of tartar to a hot strong solution of carbonate of sodium, boiling, filtering, concentrating, and crystallising.

A Hydragogue Cathartic. (Page 479.)

Dose—$\frac{1}{4}$ to $\frac{1}{2}$ oz. Lemonade makes an agreeable vehicle.

℞ It forms the basis of Seidlitz Powders, which contain in the blue paper $\frac{1}{4}$ oz. Rochelle Salt, mixed with 40 grs. bicarbonate of sodium, and in the white paper 38 grs. tartaric acid.

Sodii Arsenias. $Na_2HAsO_4,7H_2O$, and $Na_2HAsO_4,12H_2O$.

Colourless transparent prisms, soluble in twice their weight of water, prepared by fusing together arsenious acid, nitrate of sodium, and dried carbonate of sodium, dissolving the fused

product in boiling water, and setting the solution aside to erystallise.

Alterative and Tonic ; possessing the properties of arsenic.

Dose—$\frac{1}{16}$ to $\frac{1}{8}$ gr., in solution or in pill. (Page 481.)

Liquor Sodii Arseniatis. 4·5 grs. *(dried)*, or 7·4 grs. in 1 oz.

A colourless solution of arseniate of sodium (rendered anhydrous by a heat under 300°) $4\frac{1}{2}$ grs. in distilled water 1 oz.

Dose—5 to 10 minims, diluted, after meals.

Sodii Bicarbonatis. $NaHCO_3$.

In white powder, or small, irregular, opaque, white scales, soluble in 10 times their weight of water, prepared by saturating carbonate of sodium with carbonic acid; or by the reaction of chloride of sodium and bicarbonate of ammonium. Often called " Baking Soda."

Antacid ; may be given in effervescence. (Page 481.)

Dose—10 to 60 grs., in solution ; 24 grs. make an effervescing draught with $\frac{1}{2}$ oz. of lemon juice. (See Citric Acid.)

Enters into Sodii Citro-Tart. Efferves. and the following :—

Liquor Sodæ Effervescens. 30 grs. to 1 pint.

Prepared by passing pure washed carbonic acid under a pressure of 4 atmospheres into a solution of bicarbonate of sodium 30 grs. in water 1 pint, corking and tying over.

Trochisci Sodii Bicarbonatis. 5 grs. in each.

White lozenges, composed of bicarbonate of sodium 3,600 grs., sugar 25 oz., gum acacia 1 oz., mucilage of gum acacia 2 oz., distilled water 1 oz., in 720 lozenges.

Dose—1 to 6 lozenges.

***Sodii Bromidum. NaBr.**

A granular white powder, consisting of monoclinic crystals, obtained by adding bromine to soda solution till a permanent brown tint remains, evaporating to dryness, fusing with charcoal, dissolving out the bromide of sodium, and crystallising from warm solutions.

Antispasmodic. Sedative like KBr. (Page 340.)

Dose—10 to 30 grs.

Sodii Carbonas. $Na_2CO_3,10H_2O$.

In large, transparent, colourless, rhombic crystals, soluble in twice their weight of water, obtained from chloride of sodium, either by reaction with bicarbonate of ammonium and ignition, or by conversion into sulphate, and adding carbon and carbonate of calcium and heating. It is known as " washing soda."

Antacid. 20 grs. neutralise about 9·8 of citric acid. (P. 482.)
Dose—5 to 30 grs., in solution.

From it all of the sodium salts can be artificially obtained.

Sodii Carbonas Exsiccata. Na_2CO_3.

A white powder, obtained by strongly heating carbonate of sodium and reducing the residue to powder. It only differs from the crystallised carbonate in being devoid of water of crystallisation, and is nearly 3 times stronger (3 grs. = 8 grs).

Dose—3 to 10 grs., in pill or powder.

Sodæ Chlorinatæ Liquor. $2\frac{1}{2}$ per cent. Cl.

A colourless solution, prepared by dissolving $1\frac{1}{2}$ lbs. carbonate of sodium in 40 oz. water, and adding 1 lb. chlorinated lime mixed with 6 pints water, and filtering.

Antiseptic and Disinfectant; used Internally and Externally.

Dose—10 to 20 minims, diluted. As a gargle, $\frac{1}{2}$ dr. to 1 oz.; as a lotion, 1 dr. to 1 oz. (Page 480.)

Cataplasma Sodæ Chlorinatæ. 2 in 14.

Prepared by gradually mixing linseed meal 4 oz. with boiling water 8 oz., and adding solution of chlorinated soda 2 oz.

A Disinfecting and Deodorising application to foul wounds.

Sodii Chloridum (Common Salt). NaCl.

In small crystalline grains, or in transparent cubical crystals; generally obtained from the native rock salt.

Tonic, Purgative, Emetic, and Anthelmintic. (Page 482.)

Dose—10 grs. as a Tonic; $\frac{1}{2}$ oz or even 1 oz. as a Purgative.

Used in making Hydrochloric Acid, Calomel, and Corrosive Sublimate.

Sodii Citro-Tartras Effervescens.

A granulated white powder, being a mechanical mixture of bicarbonate of sodium 17 oz., tartaric acid 9 oz., citric acid 6 oz., sugar 5 oz., all in powder, heated between 200° and 220° until the particles begin to aggregate, and then assiduously stirred till they become granulated. When added to water, brisk effervescence follows, and solution of citro-tartrate of sodium is formed.

Dose—1 to 2 drs. as a Refrigerant and Laxative. It is commonly called "granular citrate of magnesia," though it does not contain any magnesia. (Page 483.)

*Sodii Ethylatis Liquor.

A colourless or brownish syrupy liquid, prepared by dissolving 22 grs. pure metallic sodium in 1 oz. ethylic or absolute alcohol.

A painless Caustic and Antiseptic painted over nævoid and cancerous growths.

Sodii Hypophosphis. $NaPH_2O_2$

A white granular salt, soluble in twice its weight of water, obtained by adding carbonate of sodium to a solution of hypophosphite of calcium, filtering, and evaporating to dryness on a water-bath, with constant stirring.

Dose—5 to 10 grs. (Page 346.)

It is a Nervine Tonic, similar to Hypophosphite of Calcium.

*Sodii Iodidum. NaI.

A white crystalline powder, prepared like iodide of potassium by using soda instead of potash solution.

Alterative, like Iodine and Iodide of Potassium. (Page 406.)

Dose—3 to 10 grs.

Sodii Nitras. $NaNO_3$.

A native salt, in colourless, obtuse rhomboids.

Used in the preparation of Arseniate of Sodium, or Nitric Acid.

Sodii Phosphas. $Na_2HPO_4,12H_2O$.

In large, transparent, efflorescent, colourless, rhombic prisms, soluble in 5 times their weight of water, prepared by dissolving bone-ash ($Ca_3P_2O_8$) in sulphuric acid, and to the acid phosphate of calcium thus formed adding a solution of carbonate of sodium.

A mild Purgative and Diuretic. (Page 484.)

Dose—$\frac{1}{4}$ to 1 oz., in water, or beef-tea or soup, instead of salt. For a child 1 year old, 15 to 20 grs. make a safe Purgative.

Used in making Ferri Phosphas and Syrup. Ferri Phosphatis.

*Sodii Salicylas. $(NaC_7H_5O_3)_2, H_2O$.

In small, almost colourless, very soluble, crystalline scales, obtained by the action of salicylic acid on carbonate of sodium or on caustic soda.

Antipyretic, Antirheumatic, and Antiseptic. like Salicylic Acid. (Page 310.)

Dose—10 to 30 grs.

Sodii Sulphas. $Na_2SO_4,10H_2O$.

In large, transparent, oblique, efflorescent prisms, soluble in three times their weight of water, and known as "Glauber's salt;" may be obtained from the residue left on making hydrochloric acid, by neutralising it with carbonate of sodium, and crystallising from solution in water.

A mild Purgative ; Hydragogue in large doses.
Dose—$\frac{1}{4}$ to 1 oz., in solution, in water.

***Sodii Sulphis.** $Na_2SO_3,7H_2O$.

Colourless, transparent, monoclinic, efflorescent prisms, obtained by the action of sulphurous acid on carbonate of sodium or caustic soda.

Antiseptic and Antiparasitic.

Dose—10 to 15 grs. in Yeasty Vomiting.

***Sodii Sulphocarbolas.** $NaC_6H_5SO_4,2H_2O$.

Colourless, transparent rhombic prisms, obtained by dissolving carbolic acid in excess of sulphuric acid, supersaturating the liquid with carbonate of barium, filtering, and treating the filtrate with carbonate of sodium, and evaporating.

Antipyretic and Antiseptic. (Page 301.)

Dose—10 to 15 grs.

Sodii Valerianas. $NaC_5H_9O_2$.

In dry, white masses, with strong odour. Prepared by decomposing Amylic alcohol (fousel oil) with sulphuric acid and bichromate of potassium, and saturating the valerianic acid thus formed with soda solution, and evaporating.

Antispasmodic in 5 gr. pills, but only used in making Zinci Valerianas.

***Sodium.** Na.

The soft metallic element sodium, introduced in the B.P. to make Liquor Sodii Ethylatis.

SPIRITUS RECTIFICATUS (Rectified Spirit). C_2H_6O.

The colourless, transparent, mobile liquid, consisting of alcohol, with 16 per cent. of water, obtained by the distillation of fermented saccharine fluids. S.G., ·838.

Stimulant, but more correctly a Narcotic. (Page 315.)

1 part to 3 of water makes "Spirit Lotion."

SPIRITUS TENUIOR (Proof Spirit). 5 in 8. 49 per cent.

A colourless liquid, consisting of rectified spirit 5 pints and distilled water 3 pints ; its S.G. is ·920.

SPIRITUS VINI GALLICI (Brandy).

Being the pale brown liquid distilled from French wine, and generally containing about 50 per cent. of alcohol.

Mistura Spiritus Vini Gallici.

Often known as egg-flip ; prepared by rubbing the yolks of two eggs with ½ oz. sugar, and adding brandy and cinnamon water of each 4 oz.

Nutritive, Restorative, and Narcotic.

Dose—1 to 2 oz.

*STAPHISAGRIÆ SEMINA (Stavesacre Seeds)—Ranunculaceæ.

The irregularly triangular, brown, dried, ripe seeds of Delphinium Staphisagria, with wrinkled and pitted testa.

Parasiticide. (Page 484.)

*Unguentum Staphisagriæ.

Prepared by heating 4 oz. crushed stavesacre seeds with 8 oz. benzoated lard on a water-bath for 2 hours, and straining. Contains 10 per cent. of oil of stavesacre.

Parasiticide used to destroy pediculi.

STRAMONII SEMINA (Stramonium Seeds)—Solanaceæ.

The small, reniform, pitted and wrinkled, brownish-black, flattened, dried, ripe seeds of Datura Stramonium.

Narcotic and Antispasmodic; chiefly used in Asthma. (P. 485.)

Extractum Stramonii.

The soft, blackish extract obtained by washing the seeds (in No. 40 powder) with ether to extract a fixed oil, after which a strong tincture is made, and evaporated to a suitable consistence.

Dose—¼ to ½ gr., in pill.

Tinctura Stramonii. 2½ oz. to 1 pint.

A brown liquid, prepared by macerating and percolating stramonium seeds (bruised) 2½ oz. with proof spirit 1 pint.

Dose—10 to 30 minims, diluted.

STRYCHNINA (Strychnine)—$C_{21}H_{22}N_2O_2$.—Loganiaceæ.

An alkaloid, in small, square, colourless octahedrons or prisms, prepared from Nux Vomica by the following method :—A tincture of Nux Vomica is made with hot spirit and water, and concentrated by evaporation, acetate of lead is added to the concentrated liquid after the spirit is evaporated, this throws down colouring matter, &c., and forms a solution of strychnine and brucine. After filtration the impure strychnine is precipitated by ammonia, repeatedly washed and redissolved in hot spirit, and the alkaloid crystallises out on cooling.

Tonic and Spinal Stimulant, resembling Nux Vomica. (P. 425.)
Dose—$\frac{1}{30}$ to $\frac{1}{12}$ gr., in solution or in pill.

Liquor Strychninæ Hydrochloratis. 1 in 100.

A colourless solution of strychnine 9 grs., dilute hydrochloric acid 14 minims, in rectified spirit $\frac{1}{2}$ oz., and distilled water $1\frac{1}{2}$ oz.
Dose—5 to 10 minims—viz., $\frac{1}{20}$ to $\frac{1}{10}$ gr.

STYRAX PRÆPARATUS (Prepared Storax)—Styraceæ.

A semi-transparent, brownish, semi-fluid resin or balsam, prepared from the bark of Liquidambar orientalis, purified with spirit, and straining.
A Stimulating Expectorant, used in making Tinct. Benzoini Co. (Page 485.)
Dose—10 to 20 grs.

SULPHUR PRÆCIPITATUM (Precipitated Sulphur). **S.**

A greyish-yellow soft powder, free from grittiness, prepared by dissolving sublimed sulphur by boiling with slaked lime, and then precipitating with hydrochloric acid, washing carefully, and drying the precipitate. Known as "Milk of Sulphur."
Laxative, but chiefly used as a Stimulant in skin diseases.
Dose—20 to 60 grs. (Page 485.)

Sulphur Sublimatum (Sublimed Sulphur). **S.**

A gritty greenish-yellow powder, prepared by sublimation from crude or rough sulphur. Known as "Flowers of Sulphur."
Laxative and Antiparasitic.
Dose—20 to 60 grs., in milk or marmalade.

In addition to Emp. Hydrarg., Emp. Ammon. cum Hydrarg., and Pulv Glycyrrhizæ Co., it enters into the following:—

Confectio Sulphuris. 1 in $2\frac{1}{2}$.

A soft yellow paste, prepared by rubbing together sublimed sulphur 1 oz., cream of tartar 1 oz., and syrup of orange peel by measure 4 oz. (or by weight 5 oz.), and tragacanth 18 grs.
Dose—60 to 120 grs.

Unguentum Sulphuris. 1 in 5.

A yellow ointment, prepared by rubbing sublimed sulphur 1 oz. with benzoated lard 4 oz.
Antiparasitic; used in itch, &c.

Sulphuris Iodidum. SI.

A greyish-black shining solid, prepared by heating together in a flask, iodine 4 oz. and sublimed sulphur 1 oz.

Unguentum Sulphuris Iodidi. 30 grs. to 1 oz.

A yellow ointment, gradually becoming black, prepared by triturating iodide of sulphur 30 grs., and by degrees adding ¼ oz. hard and ¾ oz. soft paraffin, and rubbing till every trace of grittiness disappears.

An Antiparasitic and Stimulating application.

SUMBUL RADIX (Sumbul Root)—Umbelliferæ.

The dried, brown, spongy, odorous, transverse slices of the root of Ferula Sumbul, "Musk Root" (Euryangium Sumbul).

Nervine Stimulant and Antispasmodic. (Page 487.)

☞ Sumbul Root is distinguished from Calumba, which it slightly resembles, by its open spongy texture and musky odour.

Tinctura Sumbul. 2½ oz. to 1 pint.

A brown sherry-coloured liquid, prepared by macerating and percolating Sumbul root (in No. 40 powder) 2½ oz. with rectified spirit 1 pint.

Dose—10 to 30 minims.

Syrupus. (See Saccharum.)

TABACI FOLIA (Leaf Tobacco)—Solanaceæ.

The large mottled-brown, hairy, ovate, dried leaves of Nicotiana Tabacum.

Narcotic, Anodyne, Sedative, and Emetic. (Page 488.)

***TABELLÆ NITROGLYCERINI** (Tablets of Nitroglycerine.

Tablets of chocolate, weighing each 2½ grs., and containing $\frac{1}{100}$ gr. pure nitroglycerine.

Antispasmodic; acting like Amyl Nitris. (Page 424.)

Dose—1 or 2.

TAMARINDUS (Tamarind)—Leguminosæ.

The brown, soft, fibrous pulp (containing brown shining seeds), of the fruit of Tamarindus indica.

Laxative and Refrigerant. (Page 488.)

Dose—½ to 1 oz., or more.

It enters into Confectio Sennæ.

TARAXACI RADIX (Dandelion Root)—Compositæ.

The long, smooth, tapering, *fresh* tap root, or the dark-brown, wrinkled, *dried*, tap-shaped root of Taraxacum officinale (Taraxacum Dens-leonis), gathered in autumn from British plants.

Diuretic, Laxative, Tonic, and feeble Cholagogue. (P. 488.)

Decoctum Taraxaci. 1 oz (*dried*) to 1 pint.

Prepared by boiling for 10 minutes dandelion root (sliced and dried) 1 oz. in distilled water 1 pint, and making the strained product measure 1 pint.

Dose—2 to 4 oz.

Extractum Taraxaci.

A rich brown "fresh" extract, prepared by evaporating the expressed juice of the fresh root.

Dose—5 to 30 grs., in solution in water, or in pill.

***Extractum Taraxaci Liquidum.** 1 in 1 (*dried*).

A dark liquid, prepared by exhausting 40 oz. *dried* dandelion root with 80 oz. proof spirit, pressing out 20 oz., treating the marc with water and evaporating to 20 oz., filtering, and mixing the liquid.

Dose—$\frac{1}{4}$ to 2 drams.

Succus Taraxaci.

A brown liquid, prepared by pressing out the juice from *fresh* dandelion root, and adding to every three measures one measure of rectified spirit.

Dose—1 to 2 drams.

TEREBINTHINA CANADENSIS—From Coniferæ.

Canada Balsam or Canada Turpentine. The straw-coloured, ductile, oleo-resin, or turpentine (as thick as honey), obtained by incision from the bark of the trunk and branches of Pinus balsamea (Abies balsamea), Balm of Gilead Fir.

A Stimulating Expectorant; used for its adhesive qualities.

Dose—20 to 30 grs., in pills made with magnesia.

Enters into Charta Epispastica and Collodium Flexile.

OLEUM TEREBINTHINÆ (Oil of Turpentine)—From Coniferæ.

The limpid colourless oil distilled usually by the aid of steam from the oleo-resin (turpentine) obtained from Pinus australis (P. palustris), from P. Tæda, from P. Pinaster, or from P. sylvestris.

Stimulant, Diuretic, Anthelmintic, and Cathartic. Externally —Rubefacient. The vapour is Astringent. (Page 489.)

Dose—10 minims to 4 drs., on sugar, or with an egg in an emulsion, or rubbed up with twice its bulk of mucilage.

Confectio Terebinthinæ. 1 in 4.

A pale brown soft paste, prepared by triturating oil of turpentine 1 oz. with liquorice root (in powder) 1 oz., and adding honey 2 oz., with constant rubbing.

Dose—1 to 2 drs.

Enema Terebinthinæ. 1 in 16.

Prepared by mixing oil of turpentine 1 oz. with mucilage of starch 15 oz.

Linimentum Terebinthinæ. 16 in 21.

A pale yellowish emulsion, prepared by dissolving camphor 1 oz. in oil of turpentine 16 oz., adding soft soap 2 oz., and distilled water 2 oz., and rubbing till thoroughly mixed.

A Stimulating application to the chest in pulmonary affections.

Linimentum Terebinthinæ Aceticum. 4 in 9.

A mixture of 4 oz. oil of turpentine, 1 oz. glacial acetic acid, and 4 oz. liniment of camphor. It is known as "St. John Long's Liniment."

An excellent Rubefacient.

Unguentum Terebinthinæ. 1 in 2.

A brownish ointment, prepared by melting together oil of turpentine 1 oz., resin 54 grs., yellow wax and lard of each ½ oz., and stirring till cold.

A Stimulating application to chronic ulcers and burns.

THEOBROMATIS OLEUM (Cacao Butter)—From Byttneriaceæ.

The yellowish, solid, concrete oil, in cakes, expressed with the aid of heat from the ground seeds of Theobroma Cacao.

Used in the preparation of 5 Suppositories.

THERIACA (Treacle).

The thick, uncrystallised, syrupy residue of the refining of sugar.

Only used for making pill masses, into 6 of which it enters, and also into Tinct. Chlorof. et Morph.

THUS AMERICANUM (Common Frankincense or Terebinthina)—From Coniferæ.

The bright-yellow, opaque, tough, solid turpentine which is scraped off the trunks of Pinus australis (P. palustris) and Pinus Tæda.

Externally—Stimulant.

Enters into Emp. Picis.

*THYMOL(Thymol)—$C_{10}H_{13}HO$.—Labiatæ and Umbelliferæ

A stearoptene, in large, prismatic, odorous crystals, obtained from the volatile oils of Thymus vulgaris, Monarda punctata, and Carum Ajowan, by making a soap with caustic potash and treating it with hydrochloric acid. It can also be obtained by reducing the oils to a low temperature.

Antiseptic and Deodorant, like Carbolic Acid. (Page 490.)

Dose—$\frac{1}{2}$ to 2 grs.

TRAGACANTHA (Tragacanth)—Leguminosæ.

A whitish gummy exudation, in horny, curved plates (like the parings of corns)—obtained from the stems of Astragalus gummifer and other species of Astragalus.

Used only for its property of swelling out when moistened with water. (Page 491.)

It enters into Pulv. Opii Co., Confect. Opii, Confect. Sulphuris, and

Glycerinum Tragacanthæ. 1 in $5\frac{1}{2}$.

A homogenous, translucent jelly, prepared by mixing 110 grs. tragacanth in powder with 1 oz. glycerine and 74 grs. of water.

A good Pill Excipient. (See page 46.)

Mucilago Tragacanthæ. 60 grs. to 10 oz.

A thick opaque liquid, prepared by mixing powdered tragacanth 60 grs. with rectified spirit 2 drs. and pouring in distilled water 10 oz.

Pulvis Tragacanthæ Compositus. 1 in 6.

A white powder, composed of tragacanth, gum acacia, and starch, of each 1 oz., and sugar 3 ozs.

Dose—As a Demulcent, 20 to 60 grs.

UNGUENTUM SIMPLEX. (See Adeps.)

UVÆ URSI FOLIA (Bearberry Leaves)—Ericaceæ.

The small, dried, brownish-green, shining leathery leaves of Arctostaphylos Uva-ursi. From indigenous plants.

Astringent, Tonic, and Sedative to the bladder. (Page 491.)

Dose—10 to 30 grs., in powder.

Infusum Uvæ Ursi. $\frac{1}{2}$ oz. to 10 oz. (1 hour.)

Prepared by infusing bruised bearberry leaves $\frac{1}{2}$ oz. in boiling distilled water 10 oz.

Dose—1 to 2 oz.

UVÆ (Uvæ Passæ or Raisins)—From Vitaceæ.

The ripe fruit of Vitis vinifera, the Grape vine, dried in the sun, or by artificial heat, in Spain.

Mildly Laxative.

Used only in Tinct. Sennæ, and Tr. Card. Co.

VALERIANÆ RHIZOMA (Valerian Rhizome)—Valerianaceæ.

The dried yellowish rhizome, with numerous bushy bundles of fibrous roots springing from it, of Valeriana officinalis. Collected in autumn from cultivated or wild plants growing in Britain.

An Antispasmodic and Stimulating Nervine Tonic. (P. 492.)

Dose—10 to 30 grs. in powder.

☞ Valerian, Serpentary, Arnica, Hellebore, and Senega are often confounded, and the student should remember a few of the distinguishing points. Thus Senega, which is very like Serpentary and Valerian, is recognised by its keel or ridge, which is not marked on the smaller rootlets, but which may be seen, like a little mesentery, at the bendings of the roots, which are of a pure *white* colour internally. The rootlets of Serpentary are smaller than those of Valerian, and are destitute of the strong, unpleasant odour of that drug. Arnica is distinguished by its dark-brown colour, aromatic odour, and peppery taste; Hellebore by its thick root-stalk, and closely-set, long, yellowish-white rootlets, covered with characteristic indentations.

Infusum Valerianæ. ¼ oz. to 10 oz. (1 hour).

Prepared by infusing bruised valerian rhizome ¼ oz. in boiling distilled water 10 oz.

Dose—1 to 2 oz.

Tinctura Valerianæ. 2½ oz. to 1 pint.

A dark brownish-red liquid, prepared by macerating and percolating valerian rhizome in No. 40 powder 2½ oz. with proof spirit 1 pint.

Dose—1 to 2 drs.

Tinctura Valerianæ Ammoniata. 2½ oz. to 1 pint.

A very dark reddish-brown liquid, prepared by *macerating* valerian rhizome in No. 40 powder 2½ oz. in aromatic spirit of ammonia 1 pint for 7 days.

A powerful diffusible Stimulant.

Dose—½ to 1 dram, freely diluted.

VERATRI VIRIDIS RHIZOMA (Green Hellebore Rhizome).

The fleshy, dried rhizome, with numerous yellowish, long roots attached, of Veratrum viride.

A Drastic Purgative, and Cardiac and Respiratory Sedative. (Page 467.)

Tinctura Veratri Viridis. 4 oz. to 1 pint.

A brown liquid, prepared by macerating and percolating green hellebore rhizome in No. 40 powder 4 oz. with rectified spirit 1 pint.

Dose—5 to 20 minims.

VERATRINA (Veratrine).

An impure alkaloid or mixture of alkaloids, in pale grey, amorphous masses, or in powder, obtained from Cevadilla (Melanthaceæ) by adding a concentrated tincture of the seeds to water (which throws down albumen and resinous matters). Filter through calico and wash the residue on the filter with water, to the liquid which passes through add ammonia, and collect the resulting precipitate and diffuse it in water, add hydrochloric acid and animal charcoal and apply heat, precipitate again the alkaloid by ammonia, and dry it.

It is almost identical with the active principle of green hellebore, and it resembles it in depressing the heart and respiration, and acting as an Emetic and Cathartic. (Page 467.)

Dose—$\frac{1}{50}$ to $\frac{1}{20}$ gr., but the Tinctura Veratri Viridis only should be used internally.

Unguentum Veratrinæ. 8 grs. to 9 drs.

A nearly white ointment, prepared by rubbing veratrine 8 grs. with olive oil 1 dram, and adding soft paraffin $\frac{3}{4}$ oz. and hard paraffin $\frac{1}{4}$ oz.

Used in Neuralgia. It acts like Ungt. Aconitinæ.

VINUM XERICUM (Sherry).

A pale yellowish-brown Spanish wine, containing about 17 or 18 per cent. of alcohol; enters into all the wines but Aurantii, Quininæ and Ferri Citratis—viz., into Aloes, Antimoniale, Colchici, Ferri, Opii, Rhei, and Ipecacuanhæ.

ZINCUM (Zinc)—Zn.

Zinc of commerce. A bluish-white, brittle metal, obtained by roasting the native sulphide (blende) or carbonate (calamine).

ZINCUM GRANULATUM (Granulated Zinc)—Zn.

Prepared by melting zinc, and pouring it in a thin stream into a two-gallon vessel of cold water.

Zinci Acetas. $Zn(C_2H_3O_2)_2.2H_2O$.

In thin, translucent, colourless, crystalline plates of a pearly lustre, soluble in less than twice their weight of water; prepared by dissolving carbonate of zinc in acetic acid, boiling, and setting aside till crystals form.

Tonic, Astringent, and Emetic; chiefly used as an injection in gonorrhœa. (2 grs. to 1 oz.) (Page 493.)

Dose—1 to 2 grs. as a Tonic; 15 to 20 as an Emetic.

Zinci Carbonas. $ZnCO_3(Zn2HO)_2,H_2O$.

A white, insoluble powder, prepared by mixing strong hot solutions of sulphate of zinc and carbonate of sodium, boiling, washing, and collecting the precipitate.

Mildly Astringent.

Employed in making the Oxide, Chloride, Sulphate, and Acetate of Zinc.

*Calamina Præparata (Native Carbonate of Zinc.) (See page 194.)

Zinci Chloridum. $ZnCl_2$.

In opaque, white, deliquescent rods or tablets; soluble in half their weight of water; prepared by dissolving granulated zinc in hydrochloric acid, and adding chlorine solution to the liquid, which will combine with any iron impurity if present, and be precipitated as a brownish powder on adding carbonate of zinc, leaving the pure chloride of zinc in solution, which is evaporated till a pellicle forms on its surface, and poured into moulds. If no iron be present the chlorine or carbonate need not be employed.

Only used externally as a powerful Caustic, mixed with 1, 2, or 3 parts of flour or powdered starch.

Liquor Zinci Chloridi. 366 grs. in 1 oz.

A heavy, colourless liquid, prepared like chloride of zinc, by boiling 1 lb. of granulated zinc in 44 oz. hydrochloric acid and 20 oz. distilled water, filtering, and adding chlorine solution till its odour is retained. Carbonate of zinc is now added to precipitate the iron impurities attacked by the chlorine, and the filtered liquid is evaporated to the bulk of 40 oz. If no iron be present the chlorine and carbonate of zinc need not be employed.

Often spoken of as "Burnett's Fluid" (which is only half its strength).

Used chiefly as a Disinfectant.

Zinci Oleatum. (Oleate of Zinc.)

Prepared by dissolving with heat 1 oz. oxide of zinc in 9 oz. oleic acid.

Acts like the oxide externally.

Unguentum Zinci Oleati. 1 in 2.

Prepared by mixing oleate of zinc and soft paraffin, of each 1 oz.

Action similar to Ungt. Zinci Oxidi.

Zinci Oxidum. ZnO.

A soft, nearly white, insoluble powder, prepared by exposing the carbonate in a loosely-covered crucible to a dull red heat. Oxide of zinc may also be obtained from metallic zinc by combustion; thus prepared it is white.

A Tonic in spasmodic nervous disorders. Externally—A mild Astringent, and Absorbent in weeping skin affections.

Dose—2 to 10 grs., in pill; often combined with belladonna in night sweating.

Unguentum Zinci. (80 grs. to 1 oz, or 1 in $6\frac{1}{2}$.)

A white ointment, prepared by adding oxide of zinc 80 grs. to melted benzoated lard 1 oz., and stirring till cold.

Zinci Sulphas. $ZnSO_4,7H_2O$.

In small, colourless, transparent prismatic crystals, obtained by dissolving granulated zinc in diluted sulphuric acid (and, if iron be present, purifying by adding chlorine and carbonate of zinc), filtering, evaporating, and setting aside for crystals to form.

☞ Often known as White Vitriol, and distinguished from Epsom salt (which it *closely* resembles) by its powerfully styptic taste.

Astringent, Emetic, and Tonic in spasmodic nervous disorders.

Dose—1 to 3 grs. as a Tonic; 10 to 30 grs. as an Emetic; 1—5 grs. to 1 oz. as an Injection.

Employed in making the Carbonate and Valerianate.

Zinci Sulphocarbolas. $Zn(C_6H_5SO_4)_2, H_2O$.

Colourless tabular crystals, obtained by heating a mixture of carbolic and sulphuric acids, saturating the product with oxide of zinc, evaporating, and crystallising.

Antiseptic.

Zinci Valerianas. $Zn(C_5H_9O_2)_2$.

In minute, brilliant, white, pearly, tabular crystals, with the odour of valerian, sparingly soluble in water; prepared by mixing strong, hot solutions of sulphate of zinc and valerianate of sodium; cooling, and skimming off the crystals which form. It can also be prepared by saturating valerianic acid with carbonate of zinc.

Antispasmodic, Nervine Tonic, and Antiperiodic.

Dose—1 to 3 grs., in pill.

Zingiber. (Ginger.) Zingiberaceæ.

The scraped and dried rhizome of Zingiber officinale, in irregular, lobed, yellowish-white, chalky pieces.

A Stimulating Aromatic and Antispasmodic.

Dose—10 to 20 grs., in powder.

Syrupus Zingiberis. About 1 in 26.

A straw-coloured, muddy syrup, prepared by adding strong tincture of ginger 6 drs. to syrup 19 oz.

Dose—1 dr.

Tinctura Zingiberis. $2\frac{1}{2}$ oz. to 1 pint.

A brown, sherry-coloured liquid, prepared by macerating and percolating ginger in powder $2\frac{1}{2}$ oz. with rectified spirit 1 pint.

Dose—15 to 60 mins., diluted.

Tinctura Zingiberis Fortior. 10 oz. to 1 pint

A brownish-red liquid, prepared by percolating ginger in *fine* powder 10 oz. with rectified spirit 1 pint (without previous maceration).

Dose—5 to 20 mins., diluted.

In addition to the above, Ginger or its compounds enter into 16 Pharmacopœial preparations, viz.:—

Confection of Opium.
,, ,, Scammony.
Infusion of Senna.
Compound Mixture of Senna.
,, Pill of Squill.
,, ,, Gamboge.
,, ,, Scammony.
,, Powder of Cinnamon.

Compound Powder of Jalap.
,, ,, Opium.
,, ,, Rhubarb.
,, ,, Scammony.
Aromatic Sulphuric Acid.
Pill of Aloes and Iron.
Wine of Aloes.
Acid Infusion of Cinchona.

PART IV.

THERAPEUTICS.

Acacia Gummi is chiefly used on account of its physical qualities for making emulsions, suspending insoluble powders in mixtures, making pill masses, &c.

Externally, it has been used as a soothing application to *burns* and *excoriations*, and internally it is administered in inflamed conditions of the *throat*, *gullet*, and *stomach*, as a basis for cough mixtures, and as a demulcent in the after treatment of cases of irritant poisoning. It acts *mechanically* by covering over the affected surface, and preventing the contact of foreign matter or irritating secretions.

A piece chewed in the mouth often affords relief by acting as a Ciliary Excitant, aiding the expulsion of tough mucus probably by exciting the cilia to increased activity through reflex stimulation of the vagus, as will be more fully mentioned in speaking of the action of some expectorants.

In mild cases of *chronic bronchitis*, or in the not uncommon class of cases where there is hyper-secretion of mucus from the larynx, trachea, and larger bronchi, oftentimes associated with winter-cough, it will be found of service.

Acidum Aceticum and Acetum.—Acetic acid possesses some properties in common with the mineral acids (only of a feebler type), which will be discussed under their names. It is refrigerant when given freely diluted—that is, it allays thirst and fever. There is no evidence that the temperature falls, but a grateful *feeling* of coolness and comfort follows its administration. It allays thirst by increasing the salivary secretion; it is mildly astringent and diuretic; and when taken internally, or applied externally, it checks perspiration, and

in full doses it diminishes the bronchial secretion. Aectum is the more palatable form for the internal use of aeetie aeid. Externally, aeetic aeid and glaeial aeetic aeid are eausties, and will produee redness, vesieation, and sloughing, in proportion to the strength of the aeid and the duration of its application. Both the aeids dissolve epithelium, and are used to destroy warty growths; and they have been highly recommended as loeal remedies in eaneer, with the intention of *dissolving* the eancer eells. A weak solution of aeetie aeid or vinegar sponged over the body in fevers is of use in lowering the temperature, probably by reflex aetion. When applied undiluted in *ringworm* it kills the parasite.

The vapour applied to the nostrils is used as a restorative in cardiae depression; it aets by reflexly influeneing the vasomotor eentre and raising the blood pressure throughout the body.

The prolonged use of this aeid diminishes the number of the red blood corpuseles, eausing anæmia and loss of weight, and it is improperly used to correet obesity.

Acidum Arseniosum and its preparations are generally deseribed as Alteratives—that is, they are medieines whieh affeet the nutrition of the body and alter or eorreet some diseased eonditions of the system without produeing any deeided symptoms, or betraying the manner in whieh they aet, save by removing the disease. Arsenie in large doses is a powerful poison, causing in half an hour a burning sensation in the throat, stomaeh, and abdomen, rapidly followed by violent vomiting, eolieky pains, diarrhœa, excessive thirst, exhaustion, and eollapse—a group of symptoms not unlike English *cholera*. After death there are found swelling and redness, with oeeasional patehes of softening of the gastro-enteric mueous membrane, and if the patient have survived long enough, fatty degeneration of the liver, kidneys, and eardiae musele. These effects are observed whether the arsenie be taken by the mouth, or injeeted into a vein, or applied to an open absorbing surfaee. The poison appears in the urine, and in the evaeuations, saliva, tears, serosity of a blister, and in the sweat, and can be readily deteeted in the parenehymatous tissues.

Chronie poisoning with arsenie is not uneommonly observed in those working with arsenieal pigments, or in those living in rooms whose walls are eovered with paper eontaining arsenieal pigments; and it may be produeed by the free use of the drug as a remedy for disease. There is irritability of the membranes covering the eye-ball, nose, pharynx, and traehea; short dry eough, anorexia, vomiting, eolie, diarrhœa, and prostration.

Sometimes nervous symptoms, as tremors, headache, and partial paralysis of the lower extremities are observed.

Arsenic in small doses ($\frac{1}{50}$ gr.) acts by its *local* influence on the gastric mucous membrane as a stomachic, increasing the digestive powers and stimulating the appetite. It is valuable in *gastric neuralgia* and occasionally in *ulcer* and irritative *dyspepsia*, and in the vomiting of chronic *alcoholism*. In larger doses $\frac{1}{20}$ gr. arsenic acts as a nerve tonic; rapidly gaining an entrance into the blood by absorption, it is carried to the nerve centres and alters their nutrition in some mysterious manner, thus it is found to possess antiperiodic properties second only to quinine, hence its value in *neuralgia*, *angina* and *ague*.

In *chronic malarial conditions* which resist quinine, arsenic is most useful, and it is well in such cases to begin with a full dose $\frac{1}{15}$ gr. It is also useful as a *prophylactic* against malaria.

In *asthma* it has been successful, especially in the form of cigarette combined with stramonium, &c.

Chorea is perhaps the disease in which the good effects of arsenic are most evident, and cases of failure are often owing to ignorance in its administration. Considerable experience has shown the writer that it is well borne in this affection, and if improvement does not follow, it is probably because a sufficient dose has not been given, and it should be pushed till the well-known physiological effects are observed, viz.:— redness of the conjunctiva, with smarting and swelling of the eyelids, especially the lower one; signs of irritation in the membrane of the nose, throat, and mouth; and indigestion, vomiting, griping and purging supervene.

In *cutaneous* affections arsenic should not be used in the *acute* stage; it is in the *chronic*, scaly, and papular skin diseases that the great benefit of arsenic is proved. In *psoriasis*, *lichen*, and even in chronic *eczema* and *acne*, it cures when all other remedies fail, but its action is slow. Hutchinson has demonstrated that it is *the* remedy for *pemphigus*, and it has been used successfully as a subcutaneous injection in *multiple sarcoma of the skin*.

Dr. Duhring first pointed out that its efficacy was greatest in diseases attacking the most superficial part of the skin, and the result of careful examination of the changes observed in the skin after experiments with arsenic, and the result of clinical experience, fully corroborate the accuracy of this statement.

Some very decided results have been observed to follow the administration of arsenic in the early stages of *phthisis* and in some malignant forms of *anæmia*.

Brunton believes that by increasing the tissue changes in the epithelial contents of the alveoli—(fatty degeneration of these cells is a constant result of chronic arsenical poisoning)—it assists in rapidly breaking up and removing effused inflammatory products, and so prevents the bacillus of tubercle finding a suitable nidus.

Externally, arsenic is a powerful caustic, causing the death of the tissue to which it is applied. It is chiefly in *cancer* and *epithelioma* that its use has been advocated; but it is dangerous, as enough may be absorbed to cause death, unless applied in a concentrated form and to a very limited extent of surface.

Sir Astley Cooper's ointment consists of 1 dr. arsenic, 1 dr. sulphur and 1 oz. spermaceti ointment applied for 24 hours.

Arsenic, unless when given for its local action upon the stomach, should always be given soon after a meal, and its effects closely watched for a short time, as some are (though rarely met with) very susceptible to its action, and it is a good rule to begin always with 2 minims of Fowler's solution ($\frac{1}{30}$ gr. arsenic), which may be increased cautiously till 15 minims are reached. Children bear large doses. A choreic child 5 years old may commence with 2 or 3 minims, gradually increased to 10, or even more. It rests upon unquestionable authority that the natives of Syria habituate themselves to swallowing lethal doses with impunity.

The iodide is given in skin diseases in the form of pills containing $\frac{1}{30}$ to $\frac{1}{15}$ gr., and Donovan's solution is a remedy of great value in the *tertiary* forms of syphilis. Often the red lavender contained in the liquor disgusts the stomach of the patient. It may then be ordered without it, as :—

℞.

Liq. Arsen. (sine Lavand.) m. lxxx.
Syrupi Aurantii ʒi.
Aquam ad ʒiv. misce.

Fiat mistura, capiat ʒj mensura ter in die post cibos, ex aqua.

Acid. Benzoicum possesses antiseptic properties. When taken in moderate doses (15 grs.) it remains unaltered as benzoic acid in the blood, but unites in the kidneys with glycocoll, and is excreted as hippuric acid, rendering the urine

acid. It thus acts as a diuretic, and, on reaching the bladder, it exercises an alterative action on its lining membrane. Its good effects are best seen in cases of mild *chronic cystitis* with high smelling, alkaline urine generally depending upon obstructed flow. It will in like manner sometimes be found useful in intractable *urethral* affections, accompanied by smarting pain on micturition. It in no way diminishes or interferes with the elimination of the uric acid. Though possessed of expectorant properties, it is inferior in this respect to the gum from which it is extracted. Its use has been advocated for *nocturnal incontinence of urine*, and sometimes an external application of a solution of 4 grs., with an equal quantity of borax in 1 oz. water, relieves the itching of many skin affections. It has been found useful in controlling the amount of albumen in the urine in *albuminuria*. It is best ordered as a powder, to be dissolved in a tumblerful of water before swallowing, or in 5 grain pills, made with glycerine.

Acid. Boricum is an Antiseptic agent of considerable power without any irritating qualities, causing the destruction of low organisms without endangering in any way the vitality of the living tissues. Hence its great value in surgery as a dressing, either in the form of the official ointment or as a lotion (5 per cent.), or as Boracic Lint, prepared by soaking lint in a hot saturated solution of the acid, and drying.

Boroglyceride—a solid (prepared by heating boracic acid and glycerine together) which can be used as a lotion in the same way as boracic acid. It has a powerful effect in preserving milk and food against putrefaction, and is innocuous. Stockings dipped in a hot solution of the acid, and dried, check effectually fetid perspiration of the feet. Internally, the acid has been given to stop fermentative changes in the stomach, and was supposed to have anodyne properties, hence its old name of Homberg's Sedative Salt.

Acid. Carbolicum is a powerful antiseptic, destroying minute forms of animal and vegetable life, and rapidly arresting fermentation, properties which go far to explain its use when given internally. It is useful in chronic *gastric* complaints, accompanied with offensive eructations, acting like creasote; it destroys sarcinæ, and stops fermentation on reaching the stomach, where, by its local action, it often allays sickness and vomiting when other remedies fail. *Diarrhœa* in a similar way is sometimes stopped by it. The sulphocarbolates of sodium and potassium are highly recommended for administration by Dr. Sansom.

Carbolic acid inhaled, as vapour or atomised spray, acts very effectually in checking the expectoration of *chronic bronchitis*, is invaluable in *gangrene of the lung*, and has the power of cutting short *influenza*. Applied as a gargle (1 dram to 1 pint) in various pharyngeal affections, or used as a lozenge, it causes anæsthesia of the mucous membrane, diminishing the reflex irritability in the palatal and other muscles, thus effectually preventing distressing attempts at swallowing, and by this means cutting short the course of *acute tonsillitis*, and relieving follicular *pharyngitis*.

It is in its external application that carbolic acid has won for itself the highest name amongst surgical remedies. Applied to the skin, it acts as a painless caustic, causing the death of a very superficial film, and, in a similar way, it may be painted over exuberant granulations. The lotion (1 oz. to 1 quart) effectually destroys the foul smell of *sores* and *ulcers*, exciting in them healthy action, and hastening the healing process. Applied to *fresh wounds*, it diminishes the risk of profuse suppuration, and is invaluable as a dressing after *amputations*.

Professor Lister, believing that suppuration is, to a large extent, caused by the action of germs admitted with the air to wounds and cavities, and, recognising in carbolic acid the power of destroying these, filters the air through various antiseptics—chiefly carbolic acid—before it is allowed to reach the raw surface. This is the principle of the now famous "Antiseptic Method" which has partly revolutionised operative surgery. Carbolic acid, when applied to the skin, or wounds, in concentrated solution, acts as a local anæsthetic, diminishing sensibility, and if the cork of the carbolic acid bottle be laid against the skin so as to affect a small area with the acid, the hypodermic or aspirator needle can be almost painlessly inserted. Its anæsthetic effect when applied to carious teeth is often marked, for this purpose it is best mixed with collodion (1 to 3). It is used successfully as an application to various *parasitic skin diseases*, and the pure acid is the best caustic we possess for *uterine ulcerations*. A strong solution applied to an extensive raw surface, may be absorbed, and produce the same poisonous effects as a large internal dose, causing violent *gastro-intestinal irritation, syncope, disturbance of respiration, muscular weakness, coma*, and *convulsions* by its action on the vaso-motor centre and cord; hence, when *extensively* employed, its effects should be watched, the urine through which it is eliminated giving the earliest indication by being turned almost black. On stopping its application no further trouble will be found.

The deep hypodermic injection of ½ gr. of the acid in 20 minims of water has been found most successful in deep-seated *inflammations, glandular* and *joint swellings, erysipelas, poisoned wounds, synovitis,* &c., repeated frequently as the cases demand.

The acid is best administered in the form of a pill; for external application, the strength of the preparation does not depend upon the amount of acid contained in it, but upon the nature of the solvent. 1 in 40 of water, which is the strength of the "Lotion" used for all ordinary purposes, produces more effect than "Carbolic Oil" composed of 1 part acid and 10 parts olive oil. Koch has shown that this latter preparation will not kill germs.

The following is a good form for internal administration :—

℞.

Acidi Carbolici, m. xxiv.

Pulv. Glycyrrhizae, gr. xlviij.

Fiat massula, et divide in pilulas xvj.

Capiat unam ter in die

Acid. Chromicum possesses the power of killing all low organisms, oxidising organic matter, coagulating albumen and destroying the tissues with which it comes in contact; it is thus an antiseptic, disinfectant, and caustic, and is chiefly used in the concentrated form to destroy *condylomata,* warty and other superficial growths, which it does effectually. 1 dr. to 1 gal. water makes an inexpensive antiseptic and disinfecting lotion for *putrid sores, leucorrhœa, ozæna,* &c., and a lotion of 10 grs. to 1 oz. has a decided effect upon *syphilitic and gouty diseases of the tongue and throat.*

Acid. Chrysophanic. (See Chrysarobin).

Acid. Citricum and Succus Limonis, identical in action with Tartaric acid, are grateful refrigerants, a small quantity sucked in the parched mouth producing a refreshing moisture by stimulating the salivary glands, and probably also all the glands of the mucous membrane down to the stomach. When administered in health, the urine becomes markedly acid under their use, but it has been found by experience that, when given in *fevers,* they do not increase the acidity of the urine. Salts of the vegetable acids act as refrigerants, but they differ from the acids in increasing the alkalinity of the blood, being oxi-

dised and converted into carbonates, in which state they pass out in the urine. Citric and tartaric acids are largely used in medicine to make effervescing draughts, which, on being swallowed whilst the carbonic acid is being given off, act as sedatives to the mucous membrane of the stomach, the gas having a soothing influence upon the terminal filaments of the nerves of this organ. Under the head of Acidum Citricum, in the Materia Medica portion of this work, will be found a useful table of the requisite proportions of different alkalies to make an effervescing mixture, and below is the formula for one of these. Lemon juice acts like citric acid, but is found to be much more efficacious in *scurvy*, acting in some way as a blood restorative, and, in addition to being a specific in this disease, it is a sure prophylactic. It has been recommended in *acute rheumatism*. A decoction of fresh lemon is believed to possess antiperiodic powers. A solution of citric acid is largely used as a substitute for lemon juice.

℞. Potassii Bicarbonatis ʒvj.
Aquae Destillatae ʒxij.
Solve, capiat cochlearia duo ampla cum succi limonis recentis cochleare amplo in effervescentia.

Acid. Gallicum and Acid. Tannicum are powerful vegetable astringents. Tannic acid coagulates albumen and mucus, but gallic does not. The way in which these substances produce their astringent effect cannot, however, be explained upon merely chemical principles. They were generally supposed to act by "tanning" or "condensing" the skin and membranes with which they came in contact, and it was believed that when taken internally they acted directly upon the muscular tissue in the arterial coats and lessened the calibre of the small vessels. Rossbach's experiments, however, prove that the vessels are dilated and that the partly chemical and partly vital action of these acids is yet to be explained.

Gallic acid is inferior to tannic as a local astringent, and tannic when administered is changed to gallic in the stomach or in the blood, and as such passes into the urine, where it is recognised by blackening iron, but not precipitating gelatine; hence gallic acid is chiefly the one selected for internal administration. These acids are useful in all *internal hæmorrhages*, in *excessive secretions* from different parts of the body,

and for cutting short *local inflammations*, as in various forms of *sore throats*, *nasal catarrh*, and *gonorrhœa*. By their action the secretion of the *bowel* is slightly lessened, the contents become more solid, and the amount of albumen in *albuminuria* is diminished. Glycerine of tannin will be found the most convenient preparation, and either acid may be given in 5 to 10 gr. doses, dissolved in water, or made into a pill with a little glycerine. The gall and opium ointment affords the best local astringent remedy for painful *hæmorrhoids*.

Tannic acid is used as an antidote in *poisoning by the alkaloids* to form tannates which are only partially soluble.

Acid. Hydrobromicum is not used for any *acid* qualities, but for the *sedative* properties which it possesses in common with bromide of potassium; its use is not followed by the depression which accompanies the administration of the potassium salt (See under Bromum.)

Acid. Hydrochloricum, Nitricum, and Sulphuricum.—These acids form a group possessing definite therapeutical qualities, and frequently are referred to as the "Mineral" acids. They all, when applied externally, act as powerful corrosives and escharotics when undiluted, and when administered internally in their strength they act similarly, destroying the tissue of the digestive tract, and producing the well-known effects of corrosive poisons. In both these cases their action may be regarded as purely *chemical*, as they in like manner act upon dead tissues. These results are explained by their action on albumen and by their great affinity for water, which they abstract so rapidly as to cause the death of the texture containing it. Nitric acid is the one selected when we wish to avail ourselves of this property, and it is used in *phagedenic ulceration* and *sloughing* by applying the strong acid with a stick. It destroys all unhealthy tissue, at the same time altering the condition of the surrounding living parts so that diseased action is stopped. It is likewise used to destroy *warty growths* and stimulate *sluggish ulcers*, and it is useful when applied to the interior of the *uterus* in chronically inflamed conditions. Its action is very superficial because it cannot redissolve the albumen which it precipitates and which thus limits its penetration into the tissue.

Strong hydrochloric acid, diluted with an equal weight of honey (making a linctus), is used to destroy the false membrane in *diphtheria* and *ulcerations of the throat*.

Strong sulphuric acid is used as an application to *carious bone*, *cancer*, and *chancres*, and phosphoric acid acts as a powerful caustic. Diluted with from 200 to 300 times their

bulk of water, they form good astringent lotions for sluggish *sores*, or gargles for relaxed conditions of the *throat*, diminishing the secretion of the part to which they are applied.

The writer has found great benefit from an injection into the bladder of nitric acid and water (as sour as the mouth can agreeably bear) in chronic *cystitis*, with ammoniacal urine. Dr. Roberts recommends a similar injection to dissolve phosphatic stone.

Internally, the mineral acids stimulate the alkaline secretions of the body and check the acid ones, thus the saliva, bile, and intestinal juice are increased, and the secretion of acid gastric juice lessened. This gives us an explanation of the great value of these acids in *dyspepsia*. Hydrochloric acid, which is a constituent of the gastric juice, is particularly useful in chronic *gastric* complaints, a dose administered *before* a meal checking the excessive irritating acid secretion and stimulating the appetite, whilst after a meal in a different class of cases, the digestion is accelerated by supplying the deficiency of acid, as pepsin refuses to dissolve fibrine unless free acid is present.

The mineral acids are rapidly absorbed, having great diffusive power, and on entering the blood they combine with bases, freeing weaker acids from their salts, and thus rendering the blood less alkaline. Whilst passing through the liver they probably influence the tissue changes which take place between the blood and the hepatic cells, as their administration diminishes the amount of urea excreted. They appear in the urine as salts of urea. Brunton thinks that probably to this alteration of tissue change in the liver the good effects of the nitro-hydrochloric acid are due in hepatic disease. They have an astringent effect upon the muscular tissue, and, consequently, are useful in checking *hæmorrhages*. The dilute or aromatic sulphuric acid in 20 minim doses, freely diluted, answers the purpose well, and also checks *sweating*.

As regards the astringency of the mineral acids, sulphuric is the strongest and hydrochloric the weakest, and their effect upon the bowel is probably *local*.

The free administration of the diluted mineral acids renders the urine slightly more acid than the normal condition, but these remedies do not cause the already alkaline urine to become acid in the same way that the vegetable acids do.

In *fevers*, the administration of the diluted mineral acids (which is spoken of as the Swedish treatment) is followed by good results. They make up for the deficiency of acid in the gastric juice, which is a feature in fever; they help to neutralise the excessive alkalinity of the blood, and to correct

the acrid alkaline motions of *typhoid fever*. Sometimes moderate doses of the dilute hydrochloric acid act as a mild purgative in fever.

℞ Acidi Hydrochlor. Dil. ʒiv.
Tincturae Aurantii ʒiij.
Infus. Quassiae ʒvij. misce.

Fiat mistura, cujus capiat cochleare amplum ter in die ex aqua ante cibos.

℞ Acidi Nitrici Dil. ʒv.
Syr. Aurantii floris ʒi.
Aq. Camphorae ad ʒx. misce.

Fiat mistura, cujus capiat cochleare amplum tertiis horis ex aqua.

Acid. Hydrocyanic. Dil.—Prussic acid is the most rapid and fatal poison known, causing death, if administered in a concentrated form, in less than a minute, by acting as a profound nervous and cardiac sedative, and paralysing all the cerebro-spinal nerves. After a large dose the patient falls, his respiration becomes convulsive, pupils dilated, and face congested, death ensuing by rapid asphyxia, succeeding convulsions and coma, though the blood in a quickly fatal case may be florid in the veins. It is used in medicine chiefly on account of its sedative action when applied to the peripheral extremities of irritated and painful nerves; hence its use in painful *gastric* disorders, accompanied with *vomiting*. 3 minim doses in *gastric ulcer* or *cancer* often giving much relief, and, by blunting the sensibility of the nerves, it is useful in the reflex vomiting of *pregnancy* and for the cough of *phthisis*, and externally allaying the itch of *urticaria*, *lichen*, &c., when applied in those latter cases as a lotion of 1 in 10—care being taken that the skin is not broken.

The preparations of bismuth may be ordered with great advantage with Prussic acid in stomach affections.

℞. Acid. Hydrocyanici dil. m. lx.
Bismuthi Carb. gr. lxxx.
Mucilaginis recentis ℥ij.
Aquam ad ℥iv. misce.

Fiat mist. cujus capiat cochleare minimum ter in die, ante cibos p. p. a.

Acid. Lactic. possesses properties similar to those of the mineral acids as described under Hydrochloric. The dilute acid has a solvent action when applied to the diphtheritic membrane, and internally it is a valuable aid in *atonic dyspepsia*, and a grateful refrigerant which has done good service in *diabetes* and *vesical catarrh*. Sour buttermilk will be found superior in most respects to lactic acid for internal use. Recently Lurtz has used glacial lactic acid made into a plaster with powdered silicic acid (equal parts) for the destruction of *lupus*. Splendid results he claims for the lactic acid—(1) it only attacks *unhealthy* tissue, (2) it is not very painful, (3) the resulting scar is not unsightly, (4) it is free from the dangers accompanying the use of arsenic.

Acid. Meconic. is an acid obtained from opium ; it possesses doubtful narcotic properties. It is the constituent of opium which gives the blood-red reaction with soluble proto salts of iron. It is introduced into the B.P. not on account of its therapeutic virtues, but to make solution of bimeconate of morphine.

Acid. Nitric. resembles hydrochloric acid in action, under which head its chief uses are mentioned. It is also recommended as a remedy in *syphilis*, but its efficacy probably depends upon its general tonic action. It has been supposed to exert an alterative or specific action upon the liver, but it is inferior to the following :—

Acid. Nitro-Hydrochlor. Dil.—In addition to the tonic properties possessed by the mineral acids, the experiments of Rutherford prove it to be an active hepatic stimulant. As a restorative in prostration and loss of appetite, following prolonged mental labour, combined with a vegetable bitter, in 15 to 20 minim doses. it will be found the most satisfactory and efficient tonic we possess. It should be *recently prepared.* Used in the form of a bath in chronic *congestion of the liver*,

by mixing 1 oz. strong nitric and 2 oz. hydrochloric acids with 2 gallons water at 98°, it will be often found useful.

Acid. Oleic. and **Oleates.**—The introduction of the oleates, and the subsequent perfecting of their preparation by Dr. Shoemaker, mark a new era in cutaneous therapeutics; but the preparations just introduced into the new B.P. under the names of Oleates of Mercury and Zinc, will not, in the writer's opinion, strengthen these remedies in the estimation of the profession. The great difficulty that these valuable compounds have found in winning their way into use has been in the imperfection of their processes of manufacture, and the consequent instability of the resulting oleates.

Shoemaker, with the aid of Dr. Wolff, has almost completely removed these difficulties. In the first instance, by procuring a pure oleic acid, which he extracted from almond oil by saponification with litharge, and subsequent purification with benzine, HCl., and steam. From this pure acid he endeavoured to make *neutral* and *chemical* oleates having neither base nor acid *in excess*. This was accomplished by first making a pure oleate of sodium, which he did by union of the acid with soda, and subsequent careful purification. The colourless body so prepared was dissolved in 8 parts of water, forming a solution from which all the other oleates can be easily prepared, by adding a neutral solution of a salt of the substance until the sodium oleate solution is *completely* decomposed. Such an oleate differs from an ointment made with a salt, and when applied, as the heat of the body causes it to liquify, the fluid oleate penetrates into the minute gland ducts of the skin; whilst in the case of an ointment, the fatty basis as it melts filters into the ducts, leaving the salt in a film upon the surface of the skin.

There is considerable difference of opinion upon the question of whether the oleates are absorbed by the skin—Shoemaker affirms they are not. The writer believes that a chemically pure neutral oleate is not absorbed, but that a preparation with a large excess of oleic acid, which is unstable and certain to be decomposed before its application, is likely to be absorbed just as common mercurial ointment can easily find its entrance into the system through the skin. This is the explanation of the opposite views upon this subject. The zinc oleate of Shoemaker is a soft unctuous powder of great value in *intertrigo*, *eczema*, and nearly every form of *superficial cutaneous inflammation*. The official oleate and its ointment can be used for similar affections, whilst the mercurial oleate is a remedy of great power in *chronic glandular* and *joint affections* and *parasitic skin diseases*, especially when attacking

the scalp or beard. The oleates of copper, silver, and the various alkaloids are elegant and cleanly vehicles for the application of these remedies.

Oleic acid itself is only used in the manufacture or preparation of the oleates.

Acid. Phosphoric. has no properties beyond those possessed by the mineral acids, as described under Acid. Hydrochloric. It is refrigerant and tonic, and is supposed by some to have the power of dissolving phosphatic deposits and bony tumours. It makes an agreeable drink in *diabetes*, without any therapeutical virtue, and should not be prescribed when we want to obtain the medicinal effects of phosphorus, since, of course, it contains no free phosphorus. The concentrated acid is a strong caustic.

Acid. Salicylic. is a powerful antiseptic and antiferment, and thus becomes a surgical dressing of great value when used either in the form of "lint" or "wadding," or "ointment" (1 to 27), or "lotion" (acid 10 parts, borax 20, water 100), or as "oil" (1 to 50 olive oil). Whilst the power and certainty of its action as an antiseptic, together with its mildness, combine to make it so valuable, it has the great disadvantage of being *nonvolatile*. It has been used with benefit as a local antiseptic application in *diphtheria*, and a solution in collodion (1 to 2) speedily destroys *corns* and *warts*. The soda salt has little lethal effect upon germs; a solution has been used as a local sedative to the joints in *acute rheumatism*.

Internally, salicin and salicylic acid have proved remedies of much value in various *febrile diseases*, but it is mainly in *acute rheumatism* that the good effects of these drugs have been duly appreciated. Maclagan, whose experience of them has been great, and to whom the profession is greatly indebted for their application to the treatment of *rheumatism*, prefers salicin to the acid as being more agreeable, safer, and more uniform, but probably the greater purity and uniformity of the acid, by more recent improvements in the details of manufacture, have led to the reverse being the more generally accepted belief *now*.

Salicylic acid, in doses of about 15 to 20 grs. every 2 or 3 hours, soon produces effects in the healthy individual like quinine—fulness in the head, buzzing in the ears, disturbances of vision, and if the dose be very considerably increased in frequency and amount, other more alarming symptoms supervene, as deafness, squinting, sighing respiration, restless delirium, with dark albuminous urine, involuntary evacuations and convulsions (it does not reduce the temperature in health).

These symptoms may terminate fatally by its paralysing action upon the respiration, though it probably requires what many would consider an enormous dose of the pure acid or its salts to bring about such an issue.

Salicylic acid is excreted by the saliva and perspiration, and appears in the urine soon after administration, and various theories are held as to its condition in the blood, some holding that it exists there as the sodium salt (Salkowski), others that it becomes an albuminate (Feser), while Binz believes that the sodium salt is decomposed in the blood by the carbonic acid, and acts there as salicylic acid. Recently Latham claims to have proved that the acid is changed into salicyluric acid and prevents the formation of uric acid in the system.

The most convenient and desirable form for the administration of the drug in disease is the soda salt. In *rheumatic fever* most decided results follow this method of treatment. The temperature is reduced generally within 24 hours. Often both pain and temperature are most markedly diminished after 12 hours.

30 grs. of salicylic acid, or salicylate of sodium, in half an ounce of any infusion or in water every two hours for 3, 4, or 6 doses, as the severity of the pain and height of the fever heat indicate, will be found the best practice to adopt. Profuse sweating will generally follow after each dose.

Often patients express relief after the first or second dose, and it is not unusual to have a fall of 3 to 5 degrees at the end of 24 or 48 hours, or a total cessation of *all* the symptoms of the disease.

It is affirmed that the chances of *heart* complications are lessened and that the course of the disease is cut short by this treatment, but we have not sufficient evidence to arrive at this conclusion till the use of the acid and its salts has been still more extensively tried. The writer, after carefully watching the effects of the soda salt in *acute rheumatism*, believes that whilst it is invaluable in its speedy and certain relief of pain and fever heat, it nevertheless does not appear to cut short the real duration of the attack, and does not appreciably prevent heart complications. Pain and fever will return if it be withheld, but yield again on its administration; still, after a considerable trial of its use most observers will arrive at the conclusion that it is an inestimable boon, and that it should be always given in this disease. Latham holds that it is decidedly curative, but he insists upon the use of the pure acid obtained from the winter-green.

In the *hyper-pyrexia* of acute rheumatism it is not safe to trust alone to the antipyretic virtues of either salicylic acid

or quinine; the cold bath should be employed. Dr. Maclagan has found the cerebral symptoms produced by large doses of salicylic acid disappear on the administration of salicin and the withdrawal of the acid.

For the high temperatures in other diseases (typhoid fever, scarlatina, pneumonia, &c.), this remedy has been found useful, but in no other affection than in rheumatism probably will it be found to supersede quinine. It possesses very decided *antiperiodic* power.

It is a cholagogue, and increases the amount and fluidity of the bile, and may be given in cases of *gall stone*.

Brunton recommends it in small doses to relieve *headache*, and in larger doses in *phlegmasia dolens*.

Acid. Sulphuric.—The astringent, tonic, and caustic properties of this remedy will be found mentioned along with the other mineral acids under the head of Acid. Hydrochlorieum. It should be remembered that it is valuable as an astringent only in bleeding from *mucous* surfaces.

Acid. Sulphurosum is used in medicine on account of the destructive effect which it produces on the lower forms of life, both animal and vegetable. Hence it is useful in *parasitic skin diseases*, applied, diluted with an equal bulk of glycerine; and internally in *pyrosis* and *fermentative conditions* of the *stomach*, depending upon the existence of sarcinæ. It has been occasionally vaunted as a remedy in *zymotic diseases*. It should be given in doses of ½ to 1 dram, freely diluted. It has been used as a spray in *laryngeal phthisis*.

Acid. Tannicum is fully discussed under "Acid. Gallieum," which it closely resembles, being, however, much more suitable for local application, whilst the gallic acid should be the one selected for internal administration.

Acid. Tartaricum is identical in therapeutic action with Acid. Citric. (which see).

Aconite is one of the most potent remedies in the Pharmacopœia, producing well-marked, definite effects, and causing death by paralysing the respiratory centre or depressing the heart without affecting the cerebral faculties. Before this event takes place various alterations in the sensory and motor apparatus occur. Weber found that a feeling of tingling occurred throughout the body, beginning in the most sensitive parts and extending gradually to the least sensitive, but the terminations of the motor nerves appear to be irritated at first. There is great depression of the entire nervous system with diminished sensibility and loss of power (bordering upon

paralysis) of all the nerves of the spine and medulla. Anæsthesia occurs owing to the perceptive *centres*, then the *peripheries*, and finally the nerve *trunks* becoming paralysed. The pupils oscillate between contraction and dilatation, finally remaining widely dilated.

It is chiefly on account of its distinct sedative action on the heart that aconite is useful, moderate doses, according to Ringer, reducing the pulse to 40 beats in the minute, and lowering the respiration; and the same authority explains its action on the ground of its paralysing all nitrogenous tissue, and thus affecting the ganglia, nerves, and muscle of the heart. Following the reduction of the pulse in febrile conditions, the heat of the body falls steadily, and the skin keeps moist, aconite acting as a diaphoretic, though this diaphoretic action in no way accounts for the reduction of temperature.

These effects produced by aconite have led to its application in the treatment of inflammations—as *pneumonia*, *peritonitis*, *rheumatism*, *and erysipelas*—some authorities going so far as believing that if the remedy is administered sufficiently early, the inflammation or fever is often prevented. It seems to be especially useful in *acute throat affections*. It should be given in small doses—1 minim of the tincture every 15 minutes for six or eight doses, then every two or three hours, and kept up while the thermometer registers above 100°. This course, which appears to many to be merely the treatment of symptoms, should not interfere with the exhibition of remedies standing upon the solid foundations of therapeutics, which aim at destroying the cause of the disease. Aconite is found very useful in *neuralgia* of the fifth nerve, and it increases the efficacy of quinine in most neuralgic conditions. Success has followed its administration in the vomiting of *pregnancy*. Externally it paralyses the sensory nerves, causing tingling when applied to the skin or tongue, and thus it often relieves *pain*, especially when rubbed in, in the form of unguentum aconitinæ, over the course of the affected nerve, or used as a liniment in *rheumatism*, *sciatica*, &c.

Adeps and Adeps Benzoatus are used solely as external emollient applications, affording a uniformly soft and unirritating base for the preparation of ointments containing more active substances. The benzoin is added to resist the putrefactive changes to which lard is so liable.

Æther is used in medicine with three different intentions—1. As a *local anæsthetic*, thrown in the form of spray upon the skin or gum, when the reduction of temperature caused by its rapid evaporation becomes so great as to freeze the part, de-

priving it of all sensibility, and permitting the performance of minor cutting operations or the extraction of teeth. The ether used for this purpose is the official "Æther Purus." 2. It is administered *internally* in moderate doses, when it reaches the stomach it stimulates its movements, increases the gastric secretion, expels flatus, and acts as a powerful diffusible stimulant and narcotic, like alcohol; it is consumed largely in some parts of Ireland as a substitute for whiskey: it is antispasmodic, and is useful in *bronchitic asthma*, in doses of ½ to 1 dram. Durande's remedy for the solution of gall-stones was a mixture of turpentine and ether. 3. It is *inhaled* to produce general anæsthesia, affecting first the cerebrum, then the sensory, and next the motor centres of the cord, next the sensory, and finally the motor centres in the medulla. It is undoubtedly safer than chloroform, having a stimulating action on the heart; when death occurs, which is rare, it is owing to the paralysis of the respiratory apparatus. It is, on the other hand, more disagreeable and more tedious, and supposed by some to be more liable to be followed by vomiting, disadvantages which, when balanced against greater safety to life, should weigh as nothing. (See under Chloroform.)

It may be given, poured upon a sponge in any form of inhaler which fits the face, 1 oz. being poured on at first, and kept up fearlessly till symptoms of insensibility show themselves. The vapour should be administered in as concentrated a form as possible. If the sponge be warmed, by wringing thoroughly out of hot water, the effect is sooner produced. Some patients require a good deal, and the writer has used a pint and a half in one instance before insensibility supervened. It can be administered in conjunction with nitrous oxide, which may be used to produce insensibility which can afterwards be kept up for a considerable time with ether, or it may be mixed with chloroform as in the A.C.E. Mixture.

Æther Acetic. resembles ether in action, only is more agreeable and milder, and acts as a mild diaphoretic in doses of half a teaspoonful in sweetened water or sherry. Hoffman's Anodyne possesses similar qualities.

Æther Nitrous—as found in the Spirit. Æther. Nitrosi—though regarded by many as a domestic remedy, is a very efficient and agreeable diaphoretic or diuretic, especially useful in dropsies in the debilitated. It possesses powerful narcotic properties like ether, when given in large doses. Dr. Walter Smith thinks its diuretic effect probably depends upon its stimulating action on the heart. It is invaluable in all *febrile affections of childhood* characterised by a hot skin;

and in full doses, 12 or 15 minims for a child one year old it soothes the irritation of *delayed dentition* better than any other safe remedy.

Prof. Leech has recently drawn attention to the value of this remedy in reducing arterial tension, like nitrite of amyl and other nitrites, and he has shown, contrary to what might be expected, that its influence upon the circulation is of considerable duration. This lets in new light upon the *diaphoretic*, *diuretic*, and *febrifuge* virtues of this worthy domestic remedy.

Alcohol Amylicum—Fousel oil—is seldom used in medicine. It is employed by the poorer classes as a counter-irritant, and is used for the preparation of valerianate of sodium and nitrite of amyl.

Alcohol Ethylicum is alcohol deprived of almost all water. It is used merely in the preparation of chloroform and ethylate of sodium; and although spiritus rectificatus is really introduced into the B.P. for its solvent action, to make tinctures, &c., and not on account of its therapeutic properties, still the student must have a clear knowledge of the action of alcohol.

The popular term of "Stimulants," as applied to the various preparations containing alcohol, is very apt to mislead. If alcohol be regarded as a true narcotic, like chloroform, ether, or, in some respects opium, much of the difficulty of comprehending its action will disappear. Narcotics at first cause a period of stimulation or excitement, afterwards followed by sleep and coma; and alcohol differs from the substances just mentioned only in degree, its period of excitement happening to be more prolonged. The true appreciation of this fact renders its use as a remedial agent easily understood.

Small doses augment the force of the heart, dilate the capillaries of the skin, and increase the mental activity—probably by dilating the cerebral vessels; while, unfortunately, the effects of large doses are too well known to need any description. Poisonous doses paralyse the nerve centres in the inverse order of their development, beginning with the higher mental or emotional centres, producing profound coma, dilated pupils, pallor of the skin, feeble pulse, a reduced temperature, embarrassed respiration, and, finally, death from paralysis of the respiratory or cardiac centres.

By hindering or lessening oxidation, poisonous doses reduce the temperature from 2° to 5° or even 10°, and often small doses cause it to fall half a degree; this effect of small doses is not constant, and is not met with in those having become accustomed to its prolonged or intemperate use. Brunton

has clearly shown that many, if not all, of the early symptoms —including the reduction of temperature—are owing to the action of the alcohol upon the vascular system by causing dilatation of the superficial vessels, and allowing the great sheet of cutaneous capillaries to cool the blood by transmission and radiation. When the surrounding air is *very cold*, these vessels, which ordinarily contract and prevent reduction of temperature, dilate to such an extent under alcohol as to cause the patient's death speedily by loss of heat in arctic climates. It appears certain that a fair quantity (it is not clear how much) disappears in the system, and is used up as food like sugar.

Alcohol is given very freely by many in *fevers*, and in *acute disease;* and elaborate directions are given for its exhibition in such cases, some authorities relying upon signs of failure in the heart and general circulation, others looking for indications from the exhausted nervous system. Much more information is needed before any definite conclusions can be arrived at. Most authorities, however, would probably agree (1) that alcohol is not necessary at all in the *majority* of cases; (2) that often unpromising cases pull through without it; (3) that in severe cases it cannot be safely withheld from those habituated to it; (4) that occasionally by the use of alcohol, life may be saved which would otherwise be lost; and (5) that it is rarely needed in the very large doses prescribed by some —6 to 10 oz. whiskey may be regarded as representing a liberal daily allowance.

There is, however, another aspect of the case about which most will agree, and that is the good effects of one large dose of alcohol at bed-time as a narcotic in very many diseases. This produces effects which can hardly be expected from any other narcotic if the patient has been a stranger to the drug. In sleeplessness from overwork, neuralgia, &c., its good effects are apparent; and, moreover, the danger of the patient becoming the victim of intemperance is reduced to a minimum when given in one large dose, like a draught of laudanum or chloral, after his retiring to bed. It should be given made in punch; and whiskey is the best form of alcohol for this purpose. In many inflammatory diseases the addition of 30 grs. of nitre is an improvement. The student should remember that in ordering wines and spirits the effects are not always in proportion to the percentage of alcohol contained in them, since the subtle ethers, which develop as the liquid becomes aged, produce characteristic effects.

Brandy, Whiskey, Gin, and Rum contain about 50 to 54 per cent. of alcohol by measure.

The following liquids contain the following percentages of alcohol by weight:—Port Wine, 16 to 17; Sherry, 15 to 16; Madeira, 14 to 15; Claret, 5 to 7; Porter (bottled) and Ale (bottled), 5 to 6.

Externally, spirit is highly esteemed by surgeons as a dressing, and by them is used in two very different ways. The ordinary "spirit lotion" is made by adding 1 part of the official Spt. Vini Rect. to 3 of water, or equal parts of whiskey and water, and so constituted may be used as an evaporating lotion, when applied to any part on lint, and the vapour permitted to escape freely. It thus cools the part, and by directly abstracting heat it modifies inflammatory action. When spirit lotion is applied on lint, and covered in with oiled silk, so that its vapour cannot escape, then it acts like a mild, stimulating poultice, possessing antiseptic properties. (See under Cataplasmata).

Aloe Barbadensis and Aloe Socotrina are cathartic, chiefly acting on the large intestine, especially its lower half, producing—in doses of 1 to 4 grs., after about 10 hours—copious softened evacuations, generally accompanied by some griping. It produces its effects when sprinkled over a blistered surface, or injected into the blood, so that it probably, as Headland thought, when administered internally, enters the blood, from which it is eliminated by the mucous membrane of the colon, which it stimulates to increased action. It has a decided stimulating effect upon the liver, and increases the quantity of bile, as Rutherford's experiments prove, at the same time acting upon the duodenum, but it only acts as a purgative when bile is present in the duodenum or intestines. Very large doses cause watery motions by increasing the intestinal secretion. Very small doses, as $\frac{1}{8}$ to $\frac{1}{4}$ gr., increase the appetite and give tone to the stomach.

The effect of this drug depends more upon the state of the bowels than upon its dose. 2 or 3 grs. will be found enough for ordinary results, and, if followed in six hours by a mild saline, will prove a very effective cathartic.

It is in *chronic constipation* that aloes is most used, and $\frac{1}{2}$ gr. in a dinner pill, or $\frac{1}{4}$ gr. with nux vomica and iron twice a day will give good results. Its use is not followed by constipation, nor is there much necessity for the dose being gradually increased, as with other cathartics. It is of value in *amenorrhœa*, being supposed to excite the uterus from its proximity to the seat of action—the rectum—but for this purpose it should be ordered with iron about the expected time of the delayed menstrual appearance. Often it relieves, but sometimes aggravates *hæmorrhoids*, and should not be given

in pregnancy or inflammatory affections of the rectum. The watery extract of Socotrine aloes is the best form for administration, and it is of it that the above doses are given; its effects are increased by the addition of a bitter.

Aloin should be given in about half the above doses.

The Compound Decoction of Aloes was observed to give good results in many intestinal complaints by Professor Gordon, and the writer has found surprising effects from it in obstinate *diarrhœa* in children and adults: cases having been observed to resist all treatment, both astringent and eliminatory, have yielded to a few 1 to 2 oz. doses of this preparation, which seems to possess some alterative action on the mucous membrane, often causing in 6 hours a soft solid motion where watery evacuations have been the rule for many days. It is, however, a most unreliable purgative—1 oz. occasionally purging at one time and constipating the next.

℞. Extracti Aloes Socot. gr. ½.
Extracti Nucis Vom. gr. ½.
Pulv. Ipecacuan. gr. ½.
Pulv. Gentianæ gr. ij. misce.

Fiat pil. mitte tales xxiv. st. i. omne die post prandium.

Alum, is an astringent, causing coagulation of albumen and gelatine, and condensation of tissue. Externally it is powerfully styptic, and the *dried* powder is an escharotic, destroying *granulations* and *warty growths.* When administered it is carried by the blood, after absorption, astringing the tissues and vessels and diminishing secretion. In this way it controls distant *hæmorrhages,* and is the best remedy in the bleeding of the bowel in *typhoid fever.* In 10 gr. doses it may be given to check the profuse secretion in *bronchitis, dysentery, diarrhœa, leucorrhœa,* and *night-sweats.* In large repeated doses (of 1 dram) it is emetic, and combined with opium, it *purges* gently in *painters' colic,* and is a remedy of great value in the treatment of *lead poisoning,* and it has been vaunted as one of the myriad specifics for *pertussis,* and for *malaria.*

The most satisfactory effects of alum are seen in its local astringent action; 4 to 8 grs. in 1 oz. water cure purulent *ophthalmia* of infants, when poured into the eye every hour,

unless it is of gonorrhœal origin ; but owing to alum possessing a solvent action on the corneal cement it may cause perforation and should be used with caution, and it should not be used if there is a breach of surface ; ½ oz. to 20 makes a valuable gargle for *relaxed throat*, a lotion for secreting *wounds*, and an injection in *gonorrhœa* and *leucorrhœa*. It has been found beneficial in membranous *croup*, and insufflation of the powder is useful in *chronic catarrh* and *nasal discharge*. The glycerine is a valuable local application to enlarged tonsils.

Ammoniacum.—A stimulating expectorant, which has fallen into disuse, but which will be always found beneficial in assisting the *aged* and *emphysematous* in getting up with greater ease the tough, viscid secretion of the chronically inflamed mucous membrane. Probably it acts by some of its constituents being excreted by the membrane, depriving the secretion of its adhesiveness. Considerable experience of its effects in a large infirmary of *aged* invalids convinces the writer that in some way it greatly facilitates expectoration, and assists *wheezing*, in doses of 10 grs. to ½ dr., rubbed into an emulsion with warm water. Larger doses act as a purgative ; and externally it is a mild irritant, the plaster often bringing out an eruption on the skin.

Ammonia, when applied externally, is a rubefacient or vesicant. A small blister may be produced in a few minutes by laying a piece of lint, soaked in the strong solution, on the skin, and rapidly covering it with a watch-glass. Its vapour, applied to the conjunctiva and respiratory tract, also acts as a powerful irritant and stimulant, by reflex action raising the blood pressure throughout the body, and is useful in *syncope* and conditions arising from *shock*. Internally, free ammonia, or its carbonate, acts as a powerful, diffusible stimulant, directly exciting the heart, and adding temporary tone to the circulatory and nervous systems ; hence, in cases of *sudden depression* and *desperate exhaustion*, a dram of the dilute liquid, mixed with twice its bulk of water, should be injected into one of the veins. Its action being the same when thrown into a vein or swallowed, shows that it is not likely that it is neutralised before absorption (perhaps owing to its high diffusive power), and it probably acts directly on the cardiac nerves, and afterwards on the entire nervous system, and is partly eliminated by the bronchial mucous membrane, which probably explains its expectorant action by thinning the viscid secretion. It is converted into urea in the blood.

Rossbach found that a *very weak* solution of ammonia painted over the mucous membrane of the trachea in a living

animal, caused a decided and large injection of the entire surface, and resulted in an increase of the mucous secretion. Stronger solutions caused excessive hyperæmia and secretion, and finally a croupous exudation on the surface. Other alkalies produced very different results.

It is also alkaline or antacid, neutralising in the stomach any excessive quantity of acid or irritating gastric juice. It slightly increases but does not diminish the acidity of the urine, and it differs from the alkalics—potassium, sodium and lithium—by first markedly *stimulating the spinal cord* (in poisonous doses) and causing tetanic convulsions. It should be injected where there is strong reason for supposing that a *clot of blood* has formed in the heart or any of the great vessels, as it aids its solution.

Carbonate of Ammonium acts like the free gas. It is emetic and purgative in large doses; and in quantities of about 8 grs., diluted freely, acts as a most efficient stimulating expectorant, and general diffusible stimulant in all prostrating febrile conditions, its administration in *measles* and *scarlatina* being followed sometimes by most satisfactory results, even reducing the temperature. It is just possible it acts by destroying the morbid poison in these cases, as it does in *wasp stings* and *insect bites* when applied locally. It is not admissible in typhoid states with ammoniacal breath. The utility of its injection in *snake bites* is doubtful.

Brewer found that the carbonate when introduced into the stomach was neutralised by the free HCl. present with the evolution of CO_2., and that death rapidly followed in cats after a dose of 10 grains. By previously neutralising the acidity of the gastric juice *no such result* followed. It was also harmless when injected in similar doses into the cellular tissues or rectum, or loop of intestine; and he maintains that the action of carbonate of ammonium is not due to the presence of the carbonic acid in combination with the base, but is dependent upon the *absorption of free ammonia* (*nascent?*) *whilst the salt is in the act of chemically combining* with the HCl. of the gastric juice.

He always found that the cardiac muscle was much stimulated, the heart continuing to beat hours after its removal from the body. This latter fact suggested to the writer the value of injections of ammonia in poisoning by chloroform.

Brewer believes that in the *condition of the gastric function* will be found the indication and explanation of the stimulating action of carbonate of ammonium; and that in cases of failing cardiac and respiratory force, it will be useless if the gastric function is also failing.

Acetate of Ammonium Solution, or spirit of Mindererus, acts, after absorption, upon the skin, causing profuse diaphoresis, and is especially useful in all the *feverish conditions* of childhood. It possesses the curious power of counteracting the immediate effects of *drunkenness*, but must be given in wineglassful doses, or, in emergency, a teaspoonful of the carbonate in a glass of vinegar acts equally as well.

A mixture containing 2 oz. of acetate of ammonium solution, 2 drs. of acetate of potassium, 4 drs. of spirit of nitre and camphor water, with a little syrup, to 8 oz., affords the most satisfactory and harmless diaphoretic, or febrifuge combination, in passing *febrile conditions*, or while awaiting a definite diagnosis in the more serious feverish states. The solution of the citrate has the same action.

Benzoate of Ammonium is a diuretic, acting like benzoic acid, and, like it, passing out as hippuric acid in the urine. It is more active than the acid. Dose—10 to 20 grs. in water.

Bromide of Ammonium resembles the corresponding potassium salt in action. (See under Bromum.) It is, however, much more useful in *whooping-cough*, adding to its antispasmodic an expectorant action, and possessing sedative influence over the mucous membrane of the pharynx and larynx. The writer has found it in hospital practice the best routine remedy for this disorder in children, combined with expectorants, like hippo and squill. It must, however, be given freely; a child one year old may get 3 grs., or in bad cases it may be pushed till drowsiness and marked sedative effects are produced. Da Costa urges its use in acute *rheumatism*.

Chloride of Ammonium is a useful expectorant when taken internally, and is most valuable when sucked in the mouth in small pieces, or, more elegantly, in the compressed discs of Wyeth, one of which, placed in the hollow above the last upper molar, between the cheek and the gum, where it will take above an hour sometimes to dissolve, will be followed by a free, painless, and often silent expectoration of mucus and checking of the cough. It often permits the subjects of *bronchial irritation* to freely expose themselves to the cold, damp, and even foggy atmosphere of a severe winter.

The writer proposes the term Ciliary Excitants for remedies which appear to have this effect upon the expectoration.

In chronic bronchitis with very profuse discharge, or in pulmonary cavities, they have little effect, but in ordinary *catarrh*, after the acute stage, they will be found very useful if persisted in, and they run no risk of upsetting the digestion. It becomes a difficult question as to the way in which these substances act. One thing, however, is certain, that it is not

by absorption, since the same effect, though in a *much less* degree, may sometimes be produced by sucking substances absolutely insoluble, as bits of glass. rubber, &c., and some of the soluble remedies produce no effect when swallowed in mixtures even in large doses; so that one is forced to the conclusion that they act by reflex action. Two conditions appear necessary to produce a *decided* effect upon the secretion, viz.—the substance should be *soluble* in the fluids of the mouth, and should produce an impression upon the nerves of taste different from that continually being caused by food. Sugar, for instance, will not affect the secretion, but, if flavoured with an essential oil, it appears to possess some power.

The impression produced upon the terminal filaments of the glosso-pharyngeal, or the lingual branch of the fifth nerve is conveyed to the centre in the medulla, whence it probably is communicated by branches of the vagus, or through the sympathetic system to the mucous membrane, or bronchus, in which it may effect nutritive, secretory, or motor changes. To pursue the subject further and inquire into the nature of these changes would be, with our present knowledge, only to enter into the region of speculation. It is, however, a well-established fact that the impression made upon the nerves of sight by seeing tempting food, or upon the nerves of smell by inhaling its odour, will cause copious secretion of gastric juice in the stomach; and the action of an irritating emetic will stimulate all the glandular apparatus of the respiratory tract, and greatly increase the quantity of bronchial mucus, as well as cause its dislodgment by the mechanical act of vomiting.

It is generally maintained that ciliary motion is quite independent of direct nervous control, and this is based chiefly upon its persistence after death, and its resistance to poisons, electricity, &c., but a careful study of the action of various drugs sucked in the mouth would lead one to suppose that they possibly acted in some way upon the cilia lining the respiratory tract, probably through the indirect action of the nervous system stimulating them to brisker and stronger movements, sweeping up secretions which, on account of their tough and adhesive properties, are with extreme difficulty and slowness carried along the membrane.

It is, however, possible that such secretory changes take place in the mucous surface, through the action of the trophic nerves of the part, as might cause the secretion to become less viscid (though it does not appear so), or the membrane more moist, whereby the cilia would be permitted to move more easily and quickly, and hurry along the secretion; in either case the result is the same. As the effects of this class of

remedies are constant when used in suitable cases, the name of "Ciliary Excitants" is proposed as a convenient term in referring to them, though it is open to the serious objection of implying a mode of action which is possibly, after all, only a conjecture.

As will be explained in speaking of some expectorants, the probability of any remedy acting as an expectorant and increasing the quantity of bronchial secretion without influencing the cilia is very slight. The cilia are parts of the same cell, the office of which is to secrete the mucus, and it is hardly in keeping with our present knowledge to suppose that the functional activity of the cells would be increased without influencing their prolongations—the cilia—even though the process of secretion should end in the death of the cell.

This salt of ammonium gives the best results of any of the series of ciliary excitants, far exceeding in effect its action when swallowed in large doses. Chloride of Ammonium was found by Anstie to be useful in *neuralgia*, and to cut short the course of *migraine* attacks, in doses of 20 grains. Murchison largely employed it in *chronic hepatic congestion*.

Phosphate of Ammonium is a diuretic, and is said to decompose the insoluble urate of sodium in the blood, forming urate of ammonium and phosphate of sodium, and is highly recommended in cases of *uric acid calculus*.

Spirit of Ammonia (Aromatic) and *Aqua Ammoniæ* afford, the former especially, agreeable methods of administering ammonia. It is, perhaps, needless to say they should be always freely diluted.

Ammonia acts as a caustic or irritant poison when swallowed, the free gas causing serious laryngeal trouble (possibly requiring tracheotomy), and violent gastric irritation, forbidding the use of the stomach-pump.

℞. Spt. Ammoniac Aromat. ʒv.
Tinct. Card. Co. ʒj.
Syrupi Aurantii ʒiij.
Aquae Destill. ʒvj. misce.

Fiat. mist. cpt. coch. i.. comp. ex. aq. tertiis horis.

Amygdala—the sweet almond—is sometimes used in medicine on account of its mild, demulcent effect when directly applied to irritated mucous membranes, but it is, however, chiefly employed as an agreeable vehicle for more potent remedies, or made into bread as a food for *diabetics*. The oil *expressed* from either variety is a bland, soothing application in *inflammatory skin affections*.

Bitter Almonds are more active, containing, in addition to emulsin, which is also found in the sweet variety, a principle called amygdalin. These two substances, when brought together in presence of water, act upon each other, the amygdalin splitting into two new bodies—Prussic acid and volatile oil of almonds—the former of which, being a deadly poison, accounts for deaths after eating bitter almonds; and it explains the action of a lotion of bitter almond emulsion in stopping the itch of various skin affections.

Amyl Nitris.—When 2 to 5 minims of this drug are inhaled a surprisingly rapid effect is produced upon the heart and arteries; the pulse is quickened, or sometimes doubled, the arteries greatly dilate, the carotid throbs, and the face flushes, and there is great general relaxation of the arterioles, with diminished blood pressure. If the dose be increased there are signs of paralysis of the motor and sensory centres in the *spinal cord*, the quickened heart and respiration become slower, and may finally cease from paralysis; tetanic cerebral convulsions occasionally arise, the temperature falls, and the blood pressure becomes *nil*. The blood in cases of poisoning assumes a *characteristic chocolate colour* from the formation of methæmoglobin, which is deoxidised with greater difficulty than hæmoglobin itself. The dilatation of the arterioles is caused by either paralysis of their muscular coats or of the local vasomotor ganglia.

Brunton *anticipated* its efficacy in *Angina Pectoris*, in which disease it has proved a blessing, lessening, when a few drops are inhaled, the arterial spasm, and in the great majority of cases producing relief from the agony of the attack. The capsules introduced and prepared by Martindale, and covered with silk, into which the amyl escapes when the capsule is broken between the thumb and fingers, afford the safest, most elegant, and rapid means for the administration of the drug. The dose is the same whether inhaled or swallowed.

It has been used with success in *epilepsy* while the attack is coming on, in *asthma*, *neuralgia*, *eclampsia*, *migraine*, and *sea sickness*. It has been used to combat the heart failure in impending death under the influence of chloroform. Through its action upon the cord, it diminishes reflex excitability, and in the case of animals sugar appears in the urine.

Dr. Macdonald finding recently that the administration of amyl greatly increased the elimination of Uric Acid in the urine, has used it in *gout* with a success which warrants further trial.

Amylum—Starch—is nutritious; but it is for its bland, unirritating qualities, when applied externally or in enema, that it has been used in medicine. The powder dusted over *erysipelatous* or *excoriated surfaces* acts as a soothing coating, shielding the part from the action of the air or irritating secretions. Occasionally the preparation with glycerine irritates the skin. Starch is an antidote for iodine.

Anethum and Anisum.—Dill, Aniseed, Coriander, Fennel, and Caraway are identical in action. They are in large doses general stimulants, and are used in medicine as remedies to relieve the *griping of purgatives*, and the pain of *colic*, and *flatus* in children, for which purpose aniseed is most used. They probably act in these latter cases as antispasmodics by reflex action; in small doses they increase the secretion of gastric juice, and all possess feeble expectorant powers by stimulating the respiratory membrane during elimination by the breath. In full doses aniseed has weak narcotic powers.

Anthemidis Flores—Chamomile—is a stomachic bitter, improving the appetite, and indirectly aiding digestion by increasing the vascularity of the gastric mucous membrane; in larger doses, especially if warm, the infusion is *emetic*. Its chief use is in *atonic dyspepsia*. Externally, a warm fomentation is a popular remedy in the early stage of inflammations and sprains. The oil is a general stimulant and antispasmodic in 5 minim doses. It diminishes reflex excitability, and has been found useful in *sick headache*.

Antimonium.—The tartrate is the salt generally used in medicine on account of its greater solubility and activity.

Externally, it reddens the skin, and brings out an eruption of pustules somewhat like *smallpox*. Owing to its counter-irritant action being uncertain, and liable to be followed by scars, it is not much used.

In large doses it is a violent irritant poison, producing inflammation of the digestive tract, with great prostration and paralysis of the motor and sensory nerves from its direct action on the *cord*. The heart is paralysed, the arterial pressure falls finally to *nil*, and the body heat and the respiration become reduced.

In medicinal doses its action varies with the quantity administered. In $\frac{1}{6}$ gr. doses it slightly reduces the force of the

pulse by its direct effect upon the heart, and acts as a diaphoretic, causing free perspiration, probably by affecting the nerve supply of the sweat glands, and it increases the secretion of the bronchial mucus. The latter effect is one of the most important of the drug, and places it in the first rank of true expectorants. It would appear that the same change occurs in the mucous membrane, as is seen in the skin, and this is especially likely, as we know that the gastric and intestinal mucous secretions are likewise increased. In slightly larger doses—$\frac{1}{4}$ to $\frac{1}{2}$ gr.—nausea is excited and the heart's action is diminished, antimony acting as a cardiac sedative; the pulse gets soft and weak, arterial tension is lowered, and general relaxation of all muscular structures supervenes; and if the dose is repeated, or one dose of 1 to 3 grs. be given, active vomiting takes place, with great depression and intensification of the former mentioned effects.

Its emetic action follows either after it is swallowed or injected into a vein, and experiment shows that it acts firstly by *directly* influencing the vomiting centre, and secondly by irritating the *terminal filaments* of the pneumogastric and exciting *reflex action*. It is eliminated by the glands of the stomach, intestines, and bronchi, and in the urine and bile, and affects the cells in the skin like arsenic when given in poisonous doses to frogs, only its action extends deeper than that of arsenic. Such, then, is the *physiological* action of tartar emetic—that is, its action when administered to a healthy organism; its *therapeutic action*, or the effects which it produces in diseased conditions, can be for the most part anticipated from this. Thus, in febrile conditions, with a hot, dry skin, its diaphoretic action will be called to our aid; in bronchial affections, with tenacious adhesive secretion, it produces great benefit; while in acute inflammations like *pneumonia* and *pleuritis*, with high-bounding pulse, great fever, and vascular excitement, it is simply invaluable, from its cardiac sedative action.

In acute inflammatory affections of the respiratory tract, especially in *croup* and *laryngeal spasmodic diseases*, it is our sheet-anchor, allaying spasm, reducing fever, and directly cutting short the progress of the disease. It is called an antiphlogistic from this power of combating *acute inflammations* of a sthenic type, and it is probable that its action in such cases is only what can be accounted for by its effects upon the heart's force and frequency, and the diminution in the respiratory movements and vascular tension.

In the violent delirium of *fevers*, Graves employed it in $\frac{1}{4}$ gr. doses with great benefit, combined with as much opium, every hour or two. In *delirium tremens*, when opium failed totally

to produce any sleep, the writer has seen it speedily act when $\frac{1}{4}$ to $\frac{1}{2}$ gr. of this salt was added.

In the *acute bronchial affections of childhood*, antimony continues to be the best remedy we possess. Combined with hippo, or given alone, in the form of the wine, $\frac{1}{2}$ to 1 teaspoonful is an emetic for a child 1 year old, and 3 minims every hour afterwards keep up the expectorant effect: but the dose can be easily regulated by keeping the little patient on the border-land of vomiting. In bad cases this treatment cannot be persisted in, as great prostration supervenes.

Tartar emetic was formerly employed to produce muscular relaxation in *dislocations* and *hernia*, a practice which has melted away before the advance of chloroform. It is still used in *rigidity of the os*, and is valuable in *acute synovitis*. Often great tolerance of the drug may be observed in feverish conditions, probably as the writer suggests, owing to the toxic effect of the poison (causing the *fever*) on the nerve centres.

Antimonial or James's Powder, the active principle of which is oxide of antimony, possesses most of the properties of the tartrate in a feeble degree. It is used in 5 gr. doses in febrile conditions, for its mild and pretty certain diaphoretic qualities.

Chloride of Antimony is a powerful caustic and corrosive liquid, only used externally.

Sulphurated Antimony possesses all the powers of the tartrate, only in a less degree. It has *alterative* properties, which have gained for it some reputation in *syphilis*, when given with calomel in Plummer's pill. It is most uncertain in action on account of its insolubility.

Apomorphine possesses none of the narcotic properties of morphine. When given by mouth or injected hypodermically it produces vomiting, and much less is required by this latter method than if administered in the ordinary way. It acts like tartar emetic *directly* upon the vomiting centre, and *reflexly* through the peripheral gastric filaments, but it is much more rapid, and its action is not followed by nausea or prostration as tartar emetic is, hence it is the most efficacious emetic known in cases of poisoning. It stimulates and then paralyses the motor, cardiac and respiratory centres and muscular fibre, without affecting motor or sensory nerves.

Apomorphine is simply invaluable as an expectorant. Rossbach, by exposing the interior of the trachea in a living animal, and watching the effect of various substances, studied the action of expectorant remedies from an entirely original point of view. He found that *emetine*, *apomorphine*, and *pilocarpine* produced a rapid and profuse pouring out of mucous

secretion, which especially in the case of the latter drug was most abundant and liquid, and filled the tubes almost to suffocation. He demonstrated at the same time that, contrary to the accepted opinion, this great *hypersecretion* was not preceded or accompanied by *hyperæmia* of the membrane; those drugs were proved by a severance of all the laryngeal nerves, and by a ligaturing of the trachea itself, to act in no *centric* or *indirect* way, but to exert their influence by *acting directly upon the peripheral endings* of the gland-nerves or minute ganglia.

Apomorphine was found to give rather better results than *emetine*, while the constitutional effects of *pilocarpine* prevented its use as an expectorant.

After these investigations, and after practical trials, extending over one year, Professor Rossbach has no hesitation in stating that these drugs are the prototype for expectorating patients, especially in *chronic inflammations* accompanied with dryness of the mucous membrane wrongly called *catarrhs*, and also in *acute catarrhs*, attended with very *viscid secretion*.

In the *bronchitis* and *croup* of children he convinced himself of the excellent and life-saving action of apomorphine.

He says, "that it is only since I learned the excellent effects of apomorphine that I can say I really like to treat catarrhs even of the most obstinate kind, and no longer, as before, approach the cases with a sense of therapeutic powerlessness."

The writer has now used it very extensively since 1881, and can speak of it quite as strongly as the above. He found it the only drug of real value in dealing with some forms of *bronchial irritation*, caused by the inhalation of flaxdust, in operatives employed in the manufacture of linen, whilst it afforded the best results in ordinary *dry catarrhs*, and especially in *asthma*. It must be, however, used with caution, from its risk of depressing the heart and possibly causing œdema of the lung. $\frac{1}{12}$ gr. every 3 or 4 hours in camphor water, with or without morphine or ipecacuanha.

Aqua.—The effects of water as a remedy depend entirely upon the form of its exhibition, and this is so varied that only a very few of its actions can be noticed here.

Internally, water is of great use in fever, in the form of ice, a bit of which sucked in the mouth allays thirst by reflex action, acting like the ciliary excitants, and bringing up thick mucus, so common in fevers. It also, probably by reflex action, stimulates feebly the cerebral circulation; and it may increase the quantity of gastric juice before being swallowed. In *ulcers*, and *irritable conditions of the stomach*, it soothes by diminishing sensation, while it checks hæmorrhage by contracting the muscular tissue of the ulcerated artery.

In ½ to 1 pint doses, cold water before food in the morning acts as a mild cathartic, by adding water to the fæces, which it probably does by being alternately absorbed, and eliminated again as it passes down the canal, stimulating the intestinal glands. Introduced into the rectum as an enema, water washes out the colon, and is the safest remedy in impacted accumulations; but, to be administered properly, it should be given by itself at about 98°, slowly injected, with the patient lying on the left side. From 3 to 8 pints can be used with safety, if not jerked up; and benefit will be found by turning the patient over gently on his right side, or on his hands and knees, or by raising the pelvis, so that the fluid gravitates along the colon to the valve.

During the administration of an enema of this kind the operator should frequently pause till the spasm of the bowel passes off, when he may begin again, till all the water that can be comfortably borne is injected, and the bowel will speedily dispel it along with its solid contents.

Of a different class are enemata of cold water, or of water containing castor oil, turpentine, soap, &c. Here the intention is to excite reflex contraction, which one endeavours to avoid in the former case, and a pint or two will be enough. Still more different are nutrient enemata, which are intended to be absorbed. They should not be more than the bulk of a few ounces, and should be of the consistence of thin arrowroot. The addition of a little laudanum assists in their retention till digestion and absorption occur. Water, when taken in large quantity, acts as a diuretic, by washing out the kidneys and bladder.

Externally, water is largely used in medicine, and its mode of action depends upon its temperature and the method of application. Bartholow states that on immersing one hand in cold water a corresponding reduction of temperature occurs in the other hand, and infers that changes in a similar way occur internally.

The impression on the sensory nerves caused by entering a bath of cold water is conducted to the respiratory centre, from which stimuli issue, setting in motion complicated respiratory and other movements, and, after a time, refrigeration occurs from the actual loss of animal heat, water acting as a good conductor; the vessels of the skin are caused to contract, and in the warm bath they relax. The hot bath at first acts as a powerful stimulant, but, if indulged in for too long a period, the heat of the body causes cardiac weakness, and prostration and fainting follow. The hot and warm baths, acting so

thoroughly on the skin and increasing its secretion, are used to cause excretion of water and urea in *dropsies*.

Ice is largely used in surgical practice as an application to inflamed parts, as in *orchitis*, *hernia*, *head affections*, &c., acting as a sedative, diminishing the amount of blood in the part, both by direct and reflex action; and water, iced, tepid, and cold, is used for dressing and irrigating wounds.

The following are the most common forms in which water is used externally as a remedial measure :—

The *Cold Bath*, which is water about the temperature of the air, or on an average of between 45° and 60° F., is used in *fevers*, and as a tonic in various diseases of the nervous system, and for its anaphrodisiac effect.

The *Tepid Bath* is water about 85° to 95°, also used in fevers.

The *Warm Bath* is water at about 98° to 100° and the *hot* bath is water at 103° to 108°, used in *dropsies*, *kidney diseases*, *catarrh*, &c., while in the *Turkish Bath* various apartments are heated from 100° to 200° F. It is used in *secondary syphilis*, *rheumatism*, &c.

The *Sitz* resembles the *hip bath*, being a vessel in which the pelvis and hips can be immersed in water at any temperature, the remainder of the body being free. It is used in the sitting posture, chiefly by female patients, for *uterine ailments*, *amenorrhœa*, &c.

The *Sponge Bath* is a shallow vessel, generally of cold water, in which the patient sits or stands while the surface of the body is sponged freely over. In its effects it is identical with the cold bath.

The *Douche* is a *sudden* application with force of a stream of water (generally cold) to the surface of the body; an invaluable remedy in the *coma of alcohol*, *sunstroke*, &c. It differs from the *shower bath*, which is the impaction of a multitude of drops, or minute streams, from a height, and from *cold affusion*, which is the pouring of a liberal volume of cold water over the surface of the body, as in *fevers*, *alcoholism*, and *laryngismus*.

The *Wet-Pack*, so much used in hydropathy, consists in enveloping the body in a linen sheet wrung out of cold water, and spread flat upon a hard mattress, upon which the patient reclines, the ends of the sheet being carefully tucked in on each side, and the feet completely covered, after which several blankets are placed upon the top of the sheet. A piece of Mackintosh sheeting is generally interposed between the wet sheet and the blankets. The pack lasts half an hour or more, and friction with dry towels finishes it.

The Hot Wet-Pack is managed in a similar way with hot water, and resembles the various *steam* baths used in dropsies, and which may be made by boiling water under a cane-bottomed chair, upon which the patient sits, surrounded completely, except the head, by a blanket.

The *Mustard Pack* is managed like the *Hot* pack by infusing a handful of powdered mustard in the hot water in which the sheet is immersed.

Sir J. Simpson's poor man's bath is made by filling 6 or 8 soda water bottles with hot water, drawing over each a stocking squeezed out of hot water, and placing them alongside the patient under the bed-clothes. They make a good bath in about 30 minutes.

The *Hot-air Bath* is made in a similar manner by burning a spirit lamp under a chair, or by introducing under the bed-clothes any of the spirit lamps made for the purpose. These latter are invaluable in *Bright's disease*.

Fomentations are merely local baths, or circumscribed hot packs, in which generally medicinal substances are introduced.

Cataplasms are similar applications of a semi-solid consistence, composed of various medicated ingredients.

It is in the treatment of *hyperpyrexia* where the temperature of the body rises to 106° or 108° and remains so, death being almost certain in such cases if let alone, that the judicious application of cold water saves life—as in *typhus* and *rheumatic fever* especially. The patient is placed in a bath of about 98°, and cold water or ice is added till the bath cools to 70°, 60°, or even 50° F., watching the temperature of the patient, as indicated in the rectum. When a fall of 3 to 5, or more degrees occurs, he is removed, wiped dry, and put to bed, where the temperature continues to fall for half an hour or more. The time in the bath varies from 5 minutes to 2 hours, and it may be repeated every 2, 3, or 4 hours (if necessary) when the case is severe. Many Continental physicians treat most cases of fever in this way.

Water at a temperature of 112° effectually checks *uterine hæmorrhage*, when injected into that organ.

Aquapuncture, or the injection of water by the ordinary hypodermic needle under the skin, or into the substance of muscles, is often followed by surprising results. Its action depends upon its nutritive effect on the nerves of the part, for pain in a superficial nerve is generally at once alleviated, and it will often produce this effect without causing any irritation around the puncture. Bartholow has derived good results from the injection of water into the substance of paralysed muscles.

For superficial pain 30 minims should be injected at the pained spot and frequently repeated—5 times within an hour if necessary.

Argenti Nitras coagulates albumen and is a powerful corrosive poison, and when applied externally it destroys the tissues, and is used to paint over exuberant granulations, its destructive effects being followed soon by an *altered action* of the parts, a result which is utilised in many chronic unhealthy inflammations, as in *gonorrhœa* (2 grs. to 1 oz.), *conjunctivitis* (10 grs. to 1 oz.), *ulcers* (30 grs. to 1 oz.), and *relaxed pharyngeal catarrhs* (20 grs. to 1 oz.). It destroys *tinea*, *warts*, and *chancres;* and the *poisons of rabid animals and snakes*, if applied in time.

Internally, nitrate of silver acts in large doses as other corrosive poisons, causing inflammation and destruction of the gastro-intestinal mucous membrane. In addition, however, it causes marked *nervous* symptoms, as *paralysis*, *spinal convulsions*, *dyspnœa*, &c., from its action upon the centres. It has been successfully used in large doses ($\frac{1}{4}$ to 2 grs.) in *ulcer of the stomach*, with the view to cauterise or alter the character of the process going on in and around the ulcer, its use being not free from danger. In *dyspepsia* and *vomiting of yeasty fluid* it often acts most beneficially. As it coagulates albumen, it possesses astringent qualities, and hence is used in *diarrhœa* depending upon ulceration; and its effects upon the gastric nerves, in doses of 1 gr., in bread-crumb pills, are sedative. It prevents *spasm*, and is useful in *epilepsy;* but owing to the discolouration of the skin following its prolonged use, it is seldom employed. It has been given in *chronic affections of the spinal cord*, in *paraplegia*, and *locomotor ataxy*. When it reaches the stomach it is precipitated by the chlorides abounding in the gastric juice, and likewise when applied to a moist surface it whitens it, owing to a film of the chloride being formed, which is afterwards changed into the black oxide.

℞.

Argenti Nitratis gr. iv.
Micae Panis (Sine Sodii Chlor.) gr. xxx.
misce.

Fiat massula et divide in pilulas xvi., st. i. ter in die, ante cibos.

Argenti Oxidum resembles closely the nitrate, except in its external effects. It is less irritating, and has been used in 1 gr. doses in *gastrodynia* and for its astringent properties in hæmorrhages, especially *menorrhagia*, and for its alterative effects upon the nerve centres, in *epilepsy*, *ataxia*, &c.

Armoracia—Horse-radish Root—when chewed, acts as a stimulant to the salivary glands, increasing their secretion—hence it is a Sialagogue. When swallowed, it increases the gastric secretion, acting as a stomachic, and after absorption it is thrown out by the kidneys, stimulating these organs in its passage—thus it is a true Diuretic. The secretion of the skin is also increased. When applied externally it is a Rubefacient, causing redness, like mustard, only less in degree.

Arnica—Externally applied, preparations of the root or flowers cause irritation of the skin, which may take on an erysipelatous action. Diluted, these preparations are said to act in such a way as to cause absorption of extravasated blood, by their effect on the absorbents of the skin; hence they are regarded as of value when applied to *sprains* and *bruises*—most of the benefit, however, may be justly ascribed to the spirit generally used along with them. Internally, arnica has been credited with many fancied virtues. It is, however, pretty certain that it acts as an irritant to the stomach and gullet, and produces diarrhœa, and in large doses diminishes, somewhat like aconite, the respiratory and circulatory functions; hence it has been regarded as a useful remedy in *fevers;* and Bartholow believes the tincture is exceptionally valuable in *delirium tremens*. It produces in poisonous doses marked nervous prostration, muscular weakness, spasmodic movements of the limbs, and collapse.

Arsenic. (See Acid, Arseniosum.)

Asafœtida, after absorption, acts as a stimulating expectorant, closely resembling the onion in its power of increasing the secretion of mucus from the air passages, probably during its excretion by this channel; and it either blunts the sensibility of the respiratory centre, diminishing the breathlessness of *emphysema*, or, by diminishing the flatus in the digestive tube, it gives more room to the easily over-burdened lungs. It is, however, in *hysterical* ailments that it is chiefly employed, controlling the irregular and erratic nervous phenomena seen in that disease, as some suppose, by the moral influence of its disgusting and intolerable odour.

It is a carminative, increasing the intestinal secretion as it does the respiratory; it acts as a mild purgative, and is very

beneficial as an enema in *flatulent colic*. The best preparation is the Fetid Spirit of Ammonia, in ½ dr. doses.

Atropine and Belladonna when applied locally act as anodynes by lessening the sensibility of the sensory nerves. Small doses cause dryness and redness of the throat and mouth, dilated pupils and disordered vision, and sometimes a peculiar scarlet eruption. By stimulating the nerve centres, a large dose produces active brain excitement, with pleasing delirium, hallucinations, illusions, and eventually sleep, whilst at the same time there is paralysis of the peripheral motor nerves. The heart becomes excited and the vascular system stimulated (standing 12 feet from a patient the writer has heard the heart sounds); ultimately the heart is paralysed; the small vessels contract, and the arterial tension is at first raised and afterwards diminished, the secretion of saliva, bronchial mucus, and sweat is stopped. At first there is forcible expulsion of urine, but soon the bladder becomes partially paralysed, the urine and urea increased, and the pupil widely dilated.

There are great difficulties in coming to a conclusion about how atropine or belladonna cause dilatation of the pupil when applied locally. Brunton has, however, done much to clear away these. In the first place it is certain that atropine does *not* dilate by any paralysing action upon the *centre* for contracting the iris, which is situated in the medulla; it is almost equally certain that the dilatation is nevertheless mainly produced by *paralysis of the sphincter*; this might occur either (1) by the action of the drug on the ends of the motor nerve, or (2) by its direct action on the muscular fibres themselves. It is proved that unless the dose of atropine be large the muscular fibres themselves are not paralysed. So that as ordinarily used the paralysis of the sphincter muscle resulting from atropine is caused by its local action upon the *ends of the filaments of the third nerve* supplying the sphincter muscle of the iris. But this is not all—from the force with which this dilatation takes place, sometimes tearing and lacerating the iris, if adherent it is evident that there is *stimulation of the dilator muscle* which receives its nerve fibres from the sympathetic; this is further proved by section of this nerve. In a former edition of this work the writer contended that the mere paralysis of the sphincter was quite enough to act as a stimulus to the opposing dilator without any necessary effect of the atropine upon the sympathetic, as Harley believes. In addition to the dilatation of the pupil following the local use of atropine, there is marked loss of accommodation. This results from paralysis of the ciliary muscle, which fails by loss of tension upon the suspensory ligament to permit the lens to become more spherical, and the eye is consequently focussed for distant objects.

As regards the manner in which belladonna causes mydriasis when given internally, Wood concludes that it does so not by influencing the nerve centres, but by being carried in the blood to the eye itself, and there acting precisely as when applied locally.

Brown-Séquard recommended belladonna with the intention of contracting the small vessels supplying diseased tracts of the nervous system, as in certain forms of *spinal paralysis*, and for a similar reason it has been employed in various *inflammations*. From its power of stopping the secretion of the mamma and skin, it is invaluable in checking *sweating* in phthisis, and preventing *inflammation of the breast* after weaning, in both of which cases it may be administered internally and applied externally. It increases the action of purgatives, by weakening the inhibitory fibres of the splanchnic. It is recommended on this account in *obstruction of the bowels*, *impacted gall-stones*, *renal calculi*, and *asthma*. Harley recommends it in *kidney affections*, where he pointed out its use in directly diminishing the congestion by contracting the small vessels.

As a *diuretic* it increases the urea in diseases threatening suppression of urine. It has only slight action upon the respiratory centre, but it has powerful effect in stopping the bronchial secretion, and has been given for the *profuse expectoration of bronchitis*. The writer has tried it in this latter condition without success. From its anodyne action it is beneficial in *neuralgia*, and Anstie advocated its use in *lumbago*, *sciatica*, and *neuralgia of the pelvic organs*. Pushed almost to the extent of showing its poisonous effects, it is curative in *whooping-cough*, and children bear very large doses. It is by far the best remedy in *incontinence of urine* in children, probably by its partially paralysing the muscular coat of the bladder. It is excreted in the urine.

Belladonna and atropine are of value as antidotes in opium poisoning, and probably would be useful in chloroform inhalation where the cardiac power seems failing.

(For nocturnal incontinence in a child 5 years old.)

℞. Tincturae Belladonnae ℥iv.
Syrupi Limonis ℥iv.
Aquae (or Aquam) ad ℥iv. misce.
Fiat mistura, cujus capiat cochleare unum minimum bis in die et hora somni.

Externally, it is used on account of its anodyne properties to relieve pain in *neuralgia* or to arrest the *suppurative process* in boils; and the plaster, in addition to relieving pain, acts by putting the place to which it is applied to some degree on the same footing as an *internal part;* hence its value as a strapping for *enlarged glands* and superficial *joint affections.* The extract often acts like a charm to *piles,* when diluted freely and applied, but occasionally it causes an intolerable smarting.

Aurantii Cortex is a mild, bitter tonic, acting on the stomach in such a way as to give it increased tone, and it feebly stimulates the appetite. It is for its flavour, which is aromatic and pleasant, that it is used in medicine.

Aurantii Flores are only used for their agreeable perfume and flavour, though some suppose them to possess hypnotic qualities.

Balsam of Peru and Tolu.—These substances are of little therapeutic power; they act as stimulating expectorants, probably because they are eliminated to some extent by the bronchial mucous membrane, and, to a still less extent, by the other mucous surfaces, to which they act as feeble stimulants. Externally, the Peruvian balsam is a mild stimulating application to *sluggish ulcers, bed sores,* and *cracked nipples,* in which cases it is often mixed with castor oil in equal quantity. In a similar way it is a valuable parasiticide, and is a good remedy for the *itch.*

Baths.—(See under Aqua.)

Beberinæ Sulphas possesses unstimulating tonic properties, it was introduced as a febrifuge, and has, undoubtedly, antiperiodic power, but so inferior to quinine and arsenic that it is now seldom employed, and the bark (nectandra) from which it is extracted shares the same disrepute.

Belæ Fructus.—There is much diversity of opinion about the *astringent* action of this drug, which is so highly prized in India for *dysentery* and *diarrhœa.* It is devoid of tannin, and appears to act as a laxative in health and as an astringent in diarrhœa. The drug varies much in its action, owing probably to the variations in the degrees of its ripeness before being collected.

Belladonna.—(See under Atropine.)

Benzoinum.—A stimulating expectorant, acting, probably, on the relaxed bronchial mucous membrane, by which some of its volatile constituents are eliminated. It possesses all the properties of its active principle, Acid. Benzoic. (which see).

The compound tincture, or friar's balsam, is an invaluable stimulating application to *ulcers and sores*, and is the best remedy for healing *tortuous sinuses* and *sinuous scrofulous tracts*, and injected (undiluted) with a fine syringe, it decomposes *fetid* secretions, and establishes healthy action in these troublesome affections. It is a valuable hæmostatic when applied to fresh *wounds*.

The compound tincture, containing benzoin, storax and tolu, is highly spoken of by Yeo, who has found it of great service in lessening the secretion and cough in *chronic bronchitis;* it may be prescribed with mucilage or tragacanth. (See page 36.)

Recently the vapour of the tincture has been found to cut short, attacks of *catarrh* and *influenza* in a surprising way, even when inhaled directly from the bottle containing it.

Bismuthum.—The preparations of bismuth act, when swallowed, as direct sedatives, by coming in contact with the excoriated or irritated filaments of the nerves supplied to the mucous membrane of the stomach. The insoluble salts are not absorbed, except in most minute quantity, but pass out by the fæces, which they blacken. However, though not capable of being detected in the blood, the long-continued use of bismuth marks the gums. Whether the sedative action on the gastric nerves is owing to mere mechanical shielding of them from irritating secretion, or to some vital change in the nerve ending, induced by contact with the bismuth, we do not know; but ample clinical experience has proved beyond doubt the great value of these salts in all *painful gastric* affections, and in the cure of *dyspepsia, ulcer of the stomach*, and *vomiting* from various causes. They are used also in *diarrhœa* in larger doses (1 dram), and sometimes as a cosmetic, and as a soothing application to *eczema, intertrigo*, &c., and have been used as an injection in *gonorrhœa*, and in *ulceration of the rectum*. The carbonate is the most useful preparation, being antacid, and may be safely combined with opium or morphine. It is also credited with astringent properties, and it is antiseptic.

The soluble salts of bismuth, viz., the citrate, and the citrate of ammonium and bismuth, are inferior to the carbonate and nitrate; they may cause irritation of the stomach and aggravation of all gastric troubles in similar doses to the insoluble salts, but in doses of about $\frac{1}{10}$ the amount they have some soothing action on the gastric membrane. The peculiar phosphorus-like odour of the breath observed during a course of bismuth has been shown to be caused by the metal tellurium found in impure preparations.

℞ Bismuthi Carb. ʒiij.
Mucilag Recentis ʒiss.
Liq. Morph. Hydrochlor. ʒiij.
Aquae ʒii. misce.

Fiat mist. ℔t. cach. min. i., ter in die ante cibos. p.p.a.

Borax, when swallowed, is absorbed, and acts in the blood like an alkali or antacid, and passes out through the kidneys, which it stimulates, acting thus as a diuretic. It also affects the uterus, which it causes to contract and expel its contents; hence, it has been used to *produce abortion* and to expel a *retained placenta.* Its *emmenagogue* properties, however, are uncertain, and it is only for its local action that borax is used much in medicine. Applied to a diseased *mucous membrane,* it soothes pain and diminishes congestion, altering the action of the part. Its action has been in this case described as astringent, but, with our present knowledge, it seems better to confess ignorance, and call it a *local alterative.*

Borax exerts a toxic power over the lower forms of life, and possesses antiseptic properties, but Boracic Acid is always selected when we wish to get this effect of borax. (See Acid. Boracic.) Of all the remedies we possess, none equal it for the painful *aphthous condition of the tongue and mouth* so often seen in childhood and infancy, and the glycerine of borax is decidedly superior to the preparation with honey as a basis. When it fails in these unwholesome states of the mouth, it will be found that it has not been carefully applied. A wide-mouthed, one-ounce bottle, filled with the preparation, should be given to the nurse to dip her index finger into (with the nail cut close) and rub it every quarter of an hour gently round the inside of the child's mouth, and the stomatitis will soon be found to yield. It is equally useful in *fissures of the tongue* in adults.

Often after exhausting *fevers,* and especially in *pelvic* or *abdominal inflammations,* the mouth assumes an unhealthy aspect, with a raw and sometimes cracked tongue, which causes great distress to the sufferer; here a large crystal of borax, licked continually by the tongue, affords marked relief when all other applications aggravate. It is an invaluable remedy for *ulcerated nipples,* and possesses the advantage of keeping the infant's mouth healthy at the same time. A warm

saturated solution applied to the *scalp* raises a lather like soap, and partially dissolves and effectually removes the dead epithelial scales. A solution of 1 dr. to 4 oz. water makes a useful lotion in *itching of the labium or anus*, and a tablespoonful of the powder, or twice as much of the glycerine in one pint of water, proves very valuable in *leucorrhœa* and *abrasions* or unhealthy states of the *vagina* or *os uteri*. It is recommended in *mercurial salivation* as a local application, and internally in *epilepsy*.

It should have been mentioned under the head of Boracic Acid, that Perez has obtained very satisfactory results from 10 gr. doses of boracic acid in cases where the urine was ammoniacal and fetid. The reaction of the urine changed, after a few doses, and the secretion rapidly lost its offensive and irritating qualities.

Bromum is very seldom employed in medicine, except in combination with potassium or ammonium, or as hydrobromic acid. It has been recommended as a deodoriser and antiseptic, and a weak solution is useful when applied to *sloughing sores*. It is a powerful caustic, and has been used as such in *ulcerations of the neck of the uterus*, but possesses no advantage over other more agreeable and better known remedies. It is an irritant poison.

Bromide of Potassium is a sedative to the nervous system; it is diffusible, and after being swallowed soon enters the blood, whence it is carried to the brain and spinal system of nerves, producing drowsiness and sleep by diminishing the quantity of blood in the cerebrum and lessening reflex excitability in the cord. It diminishes the power of sensation, as shown in the anæsthesia of the skin of various parts in which tactile sensibility is most developed. It produces partial loss of sensation, and diminished reflex irritability in the back of the throat, which may be freely swept round with the finger—after a course of bromide—without exciting efforts to swallow or vomit. The diminished sensibility in the pharynx has been considered by some authorities to be owing to the local effect of the salt, as it is being eliminated by the mucous membrane of the part.

Bartholow found that a dose of 2 drs. lowered the temperature of a healthy adult $\frac{1}{5}$ to $\frac{1}{2}$ a degree, the respirations 2 to 5, and the pulse 10 to 20 beats per minute. Reynolds believes that the drug acts as a sedative to the sympathetic system. *Bromism* is the name given to a group of varying symptoms following the prolonged use of the bromides, anæmia, mental dulness, unsteady gait, muscular weakness and prostration, dyspnœa on exertion, loss of sexual power, sleepiness, fetor, and

sometimes a smell of bromine from the breath, general diminished tactile sensibility, and eruptions of acne spots about the face and shoulders. The salt is eliminated through the skin, breath, urine, and fæces. The bromides of potassium and ammonium are almost identical in action, only the latter is of more use in *whooping cough* and *respiratory spasmodic affections*. Hydrobromic acid is the least objectionable form in which to get the effects of bromides, as its use is entirely free from the depressing effects which follow the administration of the potash salt, and which are caused by the potassium base.

Therapeutical action.—Bromide of potassium has been used in various *nervous* affections associated with convulsive movements, as in *epilepsy*, for which it is by far the best remedy, especially in the worst forms, for it is strange that the minor epilepsy, or *petit mal*, is often unaffected by it. In these cases the dose should be large—20 to 40 grs. three times a day, or ½ to 1 dr. of the acid—and animal food should be diminished or stopped during the use of the bromide, which should be continued for a long time after all trace of the disease has disappeared. *Laryngismus*, *whooping-cough*, *asthma*, *tetanus*, *delirium tremens* in its first stage, *acute mania*, *migraine*, *vasomotor changes* (so common at the cessation of menstruation), *menorrhagia*, and *nocturnal seminal emissions* are all decidedly benefited by the bromides, and in many a cure permanently results. Its utility in these conditions is to a large extent explained by its power of diminishing reflex action. It appears, generally speaking, to have more curative power in many of these ailments occurring in the vigorous than in the anæmic; this is particularly true in *neuralgia*.

In *sleeplessness*, arising from prolonged mental labour or worry, the bromide is invaluable. A full dose of 40 grs. at bedtime, repeated in 1 or 2 hours if necessary, produces refreshing sleep so different from that of any other narcotic as to lead one to believe it acted on the brain like natural sleep, which is characterised by anæmia; hence one explanation of its action in various affections accompanied by symptoms of *congestion of the head*. In this way it sometimes relieves *cerebral vomiting* when other remedies fail, and it stops the *convulsions* of several diseases, as *acute hydrocephalus*, &c., without in any way curing the maladies. Occasionally it has produced good results in some forms of *diabetes*.

It has been used in *tetanus* and *strychnine poisoning*. The bromide of potassium acts as an alterative like the iodide, only much more feebly; and it has been used to reduce *enlargements of glands* and *syphilitic growths*, and *hypertrophy of the spleen*, though it should only be given in these cases (owing to

its uncertainty) when the iodide cannot be tolerated. Acne follows its use very often, and when it attacks the face is a barrier to its exhibition. This is largely prevented by adding a little arsenic, as in the following formula. The writer has often seen severe erythema nodosum follow its administration, and a host of cutaneous ailments have been attributed to its action.

It should not be given in anæmic conditions, and it is worth remembering that it greatly increases the hypnotic effects of chloral, belladonna, opium, and hyoscyamus: and sometimes it will be found that the effect of bromide of potassium will be increased by combining it with the bromides of ammonium and sodium.

(For Epilepsy in an Adult).

℞. Acid. Hydrobrom. dil. ℥iij.
Liquoris Arsenicalis ℥iss.
Syrupi Aurantii ℥ij.
Aq. Destillatae ad ℥xx. misce.

Fiat mistura, cujus capiat semi-unciam ter in die.

(For Whooping-cough in a child 3 years old).

℞. Ammon. Bromidi ℥iss.
Vini Ipecac. ℥iv.
Syrupi Scillae ℥iv.
Tr. Camph. Co. ℥ij.
Aquam ad ℥ij. misce.

Fiat mist. capiat cochleare i. min. tertiis horis.

Buchu when administered, soon finds its way into the blood; the volatile oil, of which it contains 1½ per cent., circulates in that fluid, and on reaching the kidneys is thrown out, acting in its elimination as a stimulating diuretic. As it comes in

contact with the genito-urinary mucous membrane in *chronic cystitis* it acts upon it, either by its own stimulating powers or by altering the previously unhealthy urine, which then becomes a tonic to the relaxed membrane. It has some action of a similar nature upon the bronchial membrane in *bronchitis*. It acts, too, on reaching the stomach, as a stomachic, increasing the vascularity of this organ and improving the appetite; hence it is occasionally administered in *atonic dyspepsia* and in *diarrhœa*.

℞ Tincturae Buchu ℥j.
Infusi ejusdem ℥ix.
Fiat mist. cujus capiat cochleare amplum tertiis vel quartis horis.

Butyl Chloral Hydras possesses properties similar to Chloral Hydrate, from which, however, it differs—firstly, in being a weaker hypnotic; secondly, in producing somewhat less cardiac depression; and thirdly, in having a specific anodyne or anæsthetic action upon the branches of the 5th nerve. It is given in cases where this drug is indicated.

It was introduced by Liebreich, who found that it produced deep sleep, with anæsthesia of the *head*, and paralysis of the respiratory muscles. He believed that its action on the heart in even fairly large doses was not dangerous, and that the life of a poisoned animal could be saved by artificial respiration after the respiratory muscles had ceased acting. Mering, however, found that its action upon the heart closely resembled that of chloral hydrate, and the results of clinical experience show that its administration cannot be conducted with much less caution than that of chloral hydrate.

As regards its effects upon relieving pain, short of producing sleep, its action is very weak, except in the case of *neuralgia of the fifth nerve*. Ringer finds it very valuable in nearly all neuralgic conditions of the face, occiput, neck, and in *migraine*.

Liebreich advised as much as 60 grs. as a soporific, whilst Yeo found sometimes that sleep followed 2 grs. Ringer "gave 5 to 10 gr. doses in a considerable number of cases, but never knew either dose to produce sleep or even drowsiness." With these differences in the doses and effects it is hard to make a rule. The writer, when using this drug, begins with 10 grs. for the first dose and 5 grs. every *two* hours for three or four more doses, and then 5 grs. 3 or 4 times daily, and he does not think it safe to exceed this at first.

It has but slight power when applied locally to the carious cavity of a painful tooth, and appears to be of very little use in ordinary toothache. It is best given in form of pill, which can be made to contain 5 grs. of the salt if a *little* mucilage be added. It can also be given in solution in water, with glycerine. The pills should be made fresh, else when given at short intervals the solution and absorption of several may awkwardly occur at once. (See page 52.)

Caffeine in moderately small doses (2 to 3 grains) produces a state of mental activity, wakefulness and restlessness, by acting as a stimulant to the brain and increasing *all* its functions. If the dose be repeated or increased, flashes of light before the eyes, noises and singing in the ear are experienced, and micturition becomes more frequent, and a state of muscular tremulousness supervenes, the temperature *rises*, and the elimination of urea, according to *most* authorities, is markedly diminished; in still larger doses delirium and sleep supervene, followed by tetanic convulsions, and *very large* doses would be required to produce death.

The cardiac and respiratory centres in the medulla are stimulated by medicinal doses, as seen by the increased pulse rate and the rise of blood pressure, and there is a marked stimulating and tonic effect upon muscular fibre. This is seen most in the cardiac muscle, whose contractions are rendered stronger and slower, and if previously faltering and irregular, become steady and firm by medicinal doses, while *large doses* may cause the healthy heart to act irregularly just as digitalis does. It is a diuretic, often acting with *promptness*, and may be given in large doses in cardiac dropsy where digitalis fails; it probably stimulates the renal cells as well as raises the blood pressure in the kidney.

The writer has employed it in *chronic Bright's disease* with great advantage, diminishing the albumen and anasarca, and increasing the quantity of urine, but the most careful and painstaking experiments, conducted on three such cases, over a prolonged period, failed to show any constant effect upon the daily elimination of urea. The diet was carefully regulated, the patients kept in bed, and the urine scrupulously collected, and the amount of urea daily calculated for some months. There was apparently a marked gain in weight in each case, and in one the albumen entirely disappeared.

Caffeine in 2 to 5 gr. doses is often efficacious in *migraine* and *unilateral* headaches, in which cases the effervescing magnesia with caffeine is a valuable and grateful preparation.

Gubler affirms, after a long experience of this drug in cases requiring revival of cardiac energy, that there is not a single

ease amenable to digitalis, which is not always so to caffeine. He gives it in doses as high as 2 grammes. The citrate is a salt of uncertain composition, and is not to be preferred to caffeine itself. The writer has employed it for six months at a time with excellent results as a cardiac tonic, in one case where digitalis could not be borne. It may be combined with digitalis or used alternately with advantage.

Difficulty is experienced in the administration of caffeine owing to its insolubility. M. Tauret found it to dissolve readily on the addition of salicylates. The following from Mr. Martindale will be found a valuable solution for hypodermic use :—

℞. Caffeinae gr. xx.
Sodii Salicyl. gr. xviiss.
Aq. Destill. ad ʒi.

Dose—5 to 15 minims.

Cajuputi Oleum is a powerful diffusible stimulant, and gives better and more definite results than any of the other essential oils. In addition to its antispasmodic powers, it has a slight narcotic and anodyne action, a large dose (10 minims) diluted in an emulsion with mucilage and sugar producing effects not unlike those following the exhibition of musk. It will be found useful in the *prostration of low fevers*, *neuralgia*, and *hysteria*.

Teaspoonful doses of the spirit of cajuput may be given every hour, in a little sherry. A full dose gives great and speedy relief in *colic*, probably stimulating the bowel by direct contact. Externally, it is a rubefacient, and may be applied to *painful* and *diseased joints* where there is much muscular spasm, and it has been used with success in *eczema* and *psoriasis*.

Calamina is used for its protective action upon *weeping and irritated cutaneous surfaces;* it acts like the oxide of zinc, which see.

Calcium—In most of its forms, in minute doses, lime is a restorative, supplying to the blood an element found in the normal tissues. Its free use, however, like the alkalies, will be found to increase waste by quickening the retrograde metamorphosis of many constituents of the blood and tissues.

Chloride of Calcium is recommended in *scrofula* and *tubercle* in 10 gr. doses. It acts as a restorative, and has been recom-

mended in *rickets* and ailments of defective nutrition; Madden believes it may cause the absorption of uterine tumours by inducing calcification. In large doses it is an irritant poison.

Carbonate of Calcium, and *Chalk* or *Creta Præparata*, are valuable antacids, possessing unirritating astringent powers. They are given when we wish to reach the *intestinal surface* with an alkaline preparation of calcium. Unless the dose is very small the chalk will find its way through the duodenum, the greater part still remaining as carbonate, and passing along the intestines it will neutralise any free acid which it meets with, forming a chloride or lactate; it thus diminishes the free secretion of the bowel, so that costive, hard, or dry motions are the result. We can easily see from this its value in the *diarrhœa* accompanied by acid, acrid evacuations, especially seen in children, generally in hot weather. It is very useful in various *stomach* derangements with acidity, but the liquor calcis is better where we want to reach the first part of the digestive tract, and it is a good rule to order these different remedies in this systematic way—*chalk* for the *intestines* and *lime water* for the *stomach*. The lime preparations being absorbed in a very slight degree, only minute doses of them need be ordered; but where local antacid action is required these salts may be freely administered, though not for a very long period without stopping, as they, like magnesia, are liable to form concretions in the bowel. Externally, chalk or the precipitated carbonate is useful, on account of its mild astringent or desiccant properties, when applied to *weeping skin diseases*, especially *intertrigo* about the groins and buttocks of infants, and both are valuable antidotes in *poisoning by the mineral acids*.

Calx, *Calcis Hydras*, and *Liquor Calcis*—Lime, from its great avidity for water, acts when applied to moist tissues as a powerful caustic, though its eschar is very superficial. It is not often used alone, but mixed with potash and moistened before application with a little alcohol, it forms the well-known Vienna Paste used in *uterine ulcerations and cancerous growths*. Slaked lime (lime to which half its weight of water is added) is not used in medicine except to make lime water, which is the most frequently employed alkaline preparation of the Pharmacopœia. When it reaches the stomach it is decomposed into the chloride or lactate, and, as such, some of it finds its way into the blood. It neutralises and checks the excessive activity of the gastric juice, when administered whilst digestion is going on.

It thus is a valuable antacid, and the residue, if the dose be large, acts as a mild astringent upon the *intestinal mucous membrane;* and, eventually, if the administration be continued,

the urine becomes alkaline, and it may thus be useful in *uric acid gravel*. It is best given in milk, as its taste cannot be detected in that liquid. 2 or 3 oz., mixed with three times as much milk, often soothes the stomach in painful *dyspepsia*, *cancer*, and *gastrodynia*, and stops the vomiting in these ailments. The addition of 1 oz. to 1 pint of cow's milk effectually prevents the formation of curdy masses, and stops *infantile vomiting* depending on this cause. Lime water makes a good injection in *leucorrhœa*.

Applied externally, lime water is a mild astringent to moist *eczema*, &c.; mixed with equal parts of olive oil it forms a rich creamy emulsion, or with linseed oil, it makes the popular Carron oil, so soothing to *burns and scalds*, and which may be improved greatly by the addition of 1 or 2 per cent. of carbolic acid; and is useful when applied to *cracked nipples*.

The saccharated solution of lime possesses the same properties as lime water, only it is about 14 times stronger.

Calcii Phosphas is of importance as a food and constituent of the body, and is present in excess wherever cell formation is active. Beneké has found it very useful in the diseases in which it appears in excess in the urine, but it does not act simply as a *restorative*, for in *rickets*, *mollites ossium*, and other lesions of *mal-nutrition*, the phosphates of lime may load the urinary secretion, and it is hard to see how the few grains daily absorbed could replace the great quantity poured out of the system in these cases.

It is thus clear that if phosphate of lime is of use in these cases (as it sometimes undoubtedly is), it must be by *striking at the root of the error of assimilation* possibly existing in the nerve centres. Its administration has been found to hasten the *repair of fractures*, and the withdrawal of lime salts from the food of animals renders the bones soft and spongy.

Brunton and others attribute the premature decay of the teeth in Americans to the absence of lime salts, caused by the perfection of their machinery, which too effectually removes the external portion of the grain in the manufacture of flour. In the stomach it undergoes changes, and enters the blood as a different salt. *Anæmia* pure and simple, is sometimes benefited by a course of phosphate of lime, as are also *scrofulous adenitis*, *phthisis*, and *chronic diarrhœa*.

Parrish's Syrup is an elegant and useful form in which to administer the Phosphates of Calcium and Iron.

Calcii Hypophosphis, in common with other Hypophosphites, has been strongly recommended in *phthisis*. In their action they resemble phosphate of lime, and like it they possess none of the properties of free phosphorus. Some have fancied that

under the use of these remedies the tubercular or scrofulous deposits are more prone to the calcareous degeneration. In *chronic bronchitis*, with much expectoration in young subjects, accompanied with loss of flesh and sweating, the hypophosphites will often give better results than any other remedy. Probably in these cases they act as nervine tonics to the respiratory and other centres.

Fellow's Syrup affords an agreeable method of administering these remedies, and seems to supply every want, combining with the lime the tonic properties of quinine, iron, and strychnine, but the writer has found that it very often is not tolerated by the stomach.

℞. Calcii Hypophosph. ʒj.
Syrupi Aurant. ʒij.
Aquae Destil. ʒij. misce.

Fiat. mist. ft. coch. i. med. pcr in die.

Calx Chlorinata (Chlorinated lime) is valuable, not on account of the lime, but because it gives off hypochlorous acid, a powerful oxidising agent, which destroys any organic matter with which it comes in contact. This acid, being itself unstable, gives off chlorine, which splits up any remaining matter by seizing on its hydrogen, and setting oxygen free. This double action makes this substance invaluable as a deodoriser. Plates covered with chlorinated lime, and moistened with water, placed in different corners of the sick room, give off, through the agency of the carbonic acid of the room, as much chlorine as keeps down effluvia. If more rapid deodorisation is required, the room is treated in a different way: the patient having been removed, the salt is placed in a deep basin, and diluted sulphuric acid poured on it, and the room closed up for 24 hours; in this way all the chlorine is liberated, and seizes upon the hydrogen, splitting up the ammonia, sulphuretted hydrogen, &c., with which it comes in contact.

By destroying the germs which cause putrefaction it acts as an antiseptic, and it destroys odours much better than carbolic acid, which has little power in this way, though this latter is a better antiseptic.

It is used with advantage when applied in solution to parasitic skin diseases and *foul sloughing wounds*, *ozæna*, &c. ½

dram of the solution added to 1 oz. water makes a good gargle in *malignant scarlatina* or *diphtheria* with fetid ulceration.

Internally, this salt has been recommended in *putrid fevers*, and may be given in the form of the solution, in 20 minim doses in peppermint water.

Calx Sulphurata is administered for the sake of an action which it is believed to possess over *suppuration*. It is regarded as an Antisuppurative preventing the process if in its early stage; and benefit has followed its use in *boils*, *abscesses*, and *acne*. In large doses it is an irritant poison, and even small doses often nauseate seriously. It is best given ($\frac{1}{5}$ gr.) in pills (see page 54).

Calumbæ Radix is one of the most popular pure bitter tonics, and, possessing no tannin, is devoid of astringency, and may be freely given with iron. Chiretta, Quassia, and Gentian closely resemble Calumba in their effects upon the stomach. By the impression which they make upon the peripheral filaments of the nerves of the tongue and mouth, they increase the saliva and the gastric juice probably even before being swallowed. The gastric juice is further increased when they reach the stomach and probably the vascularity of the organ is somewhat augmented, since these remedies in large doses cause irritation, and, when long continued, a low form of gastritis, apparently by over-stimulation. The gastric secretion being thus more freely poured out, the supply regulates the demand, and the appetite is improved. Changes of a similar nature probably occur further down the intestinal tube, and the digestion beyond the duodenum is possibly improved.

These bitters are used in *dyspepsia* and in the *debility attending convalescence from acute diseases*, where they are sometimes invaluable in stimulating the appetite and digestion, and sometimes have a sedative action upon an irritable mucous membrane, thus controlling nausea and vomiting. They are contra-indicated in all inflammatory states of the gastro-enteric tract. To get the full benefit of a vegetable bitter it is necessary to order its various preparations in combination.

℞. Tinct. Calumbae ℥j.
Infus. Calumbae ℥vij. misce.

Fiat mist. cujus capiat cochlearia duo ampla ter in die ante cibos.

Cambogia.—Gamboge is a hydragogue cathartic; when swallowed in large doses it acts as an irritant to the mucous membrane of the digestive tract, exciting the various glands to pour out increased secretion, and thus augmenting considerably the watery element in the motions, which, after a full dose, become liquid. The vermicular contractions are greatly intensified, and the contents are swept rapidly down the canal.

Its action is severe, and the griping pains caused by it are very annoying, so that it is seldom now used alone, though it is an excellent addition to many purgative pills. In small doses it is diuretic, and the colouring matter has been said to stain the urine. The compound pill may be given in 5 grain doses every 6 hours in *dropsies* and *obstinate constipation*. The action of gamboge is more marked on the small intestine than on the colon. In large doses (under a dram) severe inflammation of the alimentary tract results, and death supervenes, unless, as is nearly always the case, active vomiting expels the drug early. In poisonous doses, Orfila found that it often only produced vomiting; owing to the violence of its action on the intestines their movements became paralysed. It has no action on the liver, though the presence of bile seems necessary for its absorption. Schaur found that the hypodermic injection of gamboge did not cause purging in dogs.

℞. Cambogiae gr. j.
Extr. Aloes Aq. gr. j.
Extr. Colocy. Co. gr. ij. misce.
Fiat pil. mitte tales xvi., št. i. am. nocte.

Camphora is very uncertain in its action, and the effects produced by small doses are so variable that it is not often employed internally, save as a flavouring ingredient. In large doses (30 grs.) it is a diffusible stimulant, directly causing a flow of blood to the gastro-intestinal membrane, and may produce vomiting; by stimulating the nerve centres it produces a comforting or exhilarating effect, occasionally going the length of gay delirium and convulsions, with increase of the strength of the pulse and the cardiac contractions, and when continued for some time it produces *loss of power of the sexual organs* (though small doses have the opposite effect). This latter may be said to be the only definite useful result of the internal administration of camphor, and it consequently is valuable in

excitement of the genitals, chordee, emissions, &c. The vapour is reputed to possess marked effects upon *catarrhal affections of the respiratory membrane*, and 10 grs. added to each dose of expectorant mixture are useful in the *chronic bronchitis* of the aged, and 10 to 15 gr. doses, repeated every six hours, benefit *dysmenorrhœa, pertussis, hysteria, and other spasmodic affections.*

Externally, it is a stimulating application, useful in *chilblains*, and its mild rubefacient properties render it a popular ingredient in most liniments for *rheumatic troubles.* The Compound Camphor Liniment is a powerful counter-irritant, and may be made to cause vesication. ½ dr. to each oz. of zinc ointment allays the itching of *eczema* about the genitals.

Milk dissolves camphor readily, 1 oz. taking up nearly 1 dram of it, and is the best method of administering the remedy, especially in *low fevers*, where a teaspoonful of the milky solution may be given every three hours.

Canellæ Cortex is a mild stimulating stomachic, increasing the vascularity of the gastric mucous membrane and augmenting its secretion, and has been used as a condiment. It is now only employed to flavour rhubarb wine.

Cannabis Indica is a true narcotic, like alcohol or opium, producing first a period of excitement, or intoxication, followed afterwards by sleep and coma. Its exciting stage, however, is better marked than that of these remedies, and is much *longer* than that of opium. It is freely indulged in, in India under the name of Hashish. The intoxication, often lasting a couple of hours, is characterised by delirium of a pleasant or boisterous kind, with surprising mental confusion and distorted ideas of the patient's individuality and position, alternating with fits of prostration bordering on catalepsy, and followed eventually with sleep, in which pleasant or mirthful dreams generally run riot. The stomach is not affected, and the appetite may be increased. It is a powerful aphrodisiac.

The sensibility is diminished, cutaneous anæsthesia and blunting of the muscular sense being observed. The pupil is dilated, constipation does not follow, and sweating is never great; hence its use has been followed by gratifying results as an anodyne in *neuralgia* (Ringer has shown its usefulness in *migraine*), a hypnotic in *sleeplessness, delirium tremens*, and especially in *mania;* an *antispasmodic* in destroying spasm and pain, as in *asthma, hepatic* and *renal colic*, &c. It is stated to act as a direct stimulant to the uterus in *menorrhagia*, and it allays ovarian irritation. It has been successfully used in the treatment of *tetanus.*

The tincture should be given in sherry, or in a teaspoonful of brandy, on account of its decomposition when added to water; but 1 oz. of mucilage emulsifies 1 dr. of tincture. The *fresh* extract ($\frac{2}{3}$ of a grain) made into a pill will be found the most reliable form, as in the following:—

℞. Ext. Cannabis Ind. gr. iv.
Pulv. Gentianae q.s. ut. fiat pil. vj.
Ɛ quibus sumatur una omni nocte.

The following is an elegant form for gastric pain:—

℞. Bismuthi Subnit. gr. lx.
Ext. Cannab. Ind. gr. vj. misce.
Divide in pil. xii., i. bis in die.

In the section on non-official remedies the reader will see noticed a preparation under "Cannabin Tannas."

Cantharides is not often administered internally, though it produces definite results, acting as a powerful irritant to the stomach and genito-urinary organs, causing in over-doses frequent painful bloody micturition, with priapism, bloody, painful stools, salivation, and symptoms of violent irritant poisoning, followed by convulsions, delirium, and asphyxia.

In small doses it is diuretic, aphrodisiac, and emmenagogue. The cantharides is absorbed, and, circulating in the blood, reaches the urinary organs, which it irritates as it is being eliminated. The effect of cantharides upon the kidney begins as a genuine inflammation within the glomeruli, which gradually spreads amongst the cells of the tubules until all the tubes become affected, producing albuminuria and hæmaturia. The mouth, stomach, and intestines are affected by direct contact with it after being swallowed, and its action on the genital organs and uterus is generally explained by the sympathy that exists between these parts and the urinary tract.

It has been advocated in various *kidney diseases*, after the acute stage, as a diuretic, and it is valuable in *bladder* cases which are characterised by want of power in the sphincter, especially in women. Its use is often beneficial in *impotence*, *gleet*, and *leucorrhœa*.

One, two, or three minims of the tincture will be found enough for an ordinary dose. It may be given in barley water every 3, 6, or 12 hours.

Externally, cantharides is used diluted in various ways as a rubefacient, as in *stimulating applications to the scalp*, where the object is to keep up a constant excessive supply of blood for the nourishment of the hair bulbs, but it is for producing vesication that the Spanish fly maintains its importance in medicine. It acts by causing a rapid local inflammation of the skin, beginning with tingling pain, heat, redness, and eventually swelling; serum appears in from 4 to 12 hours.

The peripheral extremities of the nerves supplying the skin of the affected part conduct the stimulus of the blister to the nerve centres, from which it may be radiated, transferred, or reflected to centrifugal or trophic nerves, which may effect various changes in the areas to which they are supplied.

In this, the most probable explanation, it is easy to see (1) the effect which blisters may produce upon distant parts; (2) they also affect parts in the immediate neighbourhood by extracting the blood from them, though this must be to a small extent; (3) they may affect neighbouring parts by direct spread of the irritation originally produced, as the peritoneum and pleura have been seen inflamed from the application of a blister to the abdomen or chest; and the writer believes that he has seen pericarditis produced in this way in thin subjects.

Space will not permit any further reference to the subject of counter-irritation; but a few instances where blisters prove beneficial in altering diseased action may be mentioned, as in *neuralgia*. Anstie pointed out that blisters applied over the seat of pain intensify the suffering, and should be applied close to the spine—over the posterior branch of the spinal nerve-trunk—from which the painful nerves issue; and *sciatica* is often benefited by a small blister.

Various *eye inflammations* are modified or checked by counter-irritation behind the ear; and though the usefulness of blisters is doubted in *acute pleuritis* and *pneumonia*, there can be little question of their value in causing the absorption of long-standing pleural effusions, in which cases great good is derived from *flying blisters*—that is, a series of very small blisters (each not larger than a crown), kept on for a short time—say, two hours. Indeed, it may be laid down as a rule that any benefit to be had from a blister is obtained during the first five hours of its application, all of which time it keeps up a stimulating effect upon the general system; after this, much depression often results, which cannot be accounted for,

as some suppose, by the mere loss of serum; if vesication does not occur in this time a poultice generally determines it. Moistening the skin with warm water before applying the blister assists its action.

In *acute rheumatism*, blisters to the affected joints have been long advocated; but Dr. Harkin has pointed out surprising results obtainable by a large blister over the heart, early in the disease (he believes it acts by curing the endocarditis which some authorities consider always to be present and to be the cause of the disease), and the writer has seen it reduce temperature and pain in a most decided way. Graves recommended blisters in various *prostrated feverish states*, and counter-irritation over the nape of the neck controls many forms of *headache*.

Dr. Harkin has recently pointed out the surprising results which may be obtained in *diarrhœa* and *cholera* by blistering the skin over the course of the vagus in the neck.

For all purposes the emplastrum cantharidis is the most manageable preparation—the liquor or collodion acts much more quickly. Unless the bleb is large it may be let alone, the blistered surface being covered with greased lint or cotton wool. Sometimes cantharides affects the urinary organs after a blister, by being absorbed through the skin; free diluent drinks, with a morphine suppository, generally remedy this.

Blisters should not be applied or kept long on the old or infirm, or on paralysed parts, or on the very young, or in acute kidney diseases.

Brunton lays stress on the advice that when *absorption* is the result desired the blister should be applied directly over the part, but if reduction of congestion or inflammation is aimed at it should be applied at a little distance, as in pericarditis it might, if applied directly over the inflamed sac, increase the mischief.

Capsicum acts as a general stimulant to the nervous system, and when taken into the mouth increases the secretion of the salivary glands. When swallowed it acts as a stimulant to the mucous membrane of the stomach, and increases its secretion, its internal local action being probably like its external rubefacient effect, so that it might be called an internal rubefacient. In repeated doses it produces a slight narcotic effect upon the brain, and increases the functional activity of the genital organs. In large doses it causes gastro-intestinal irritation, or inflammation, and may act as a diuretic.

Prof. Chéron believes that it acts upon the vascular system, and, like ergot, affects powerfully the unstriped muscular fibre in the walls of the vessels, either directly or through the vaso-

motor nerves. Some benefit has followed its use in *uterine hæmorrhage* caused by fibroids; granular endometritis, and in hæmoptysis in doses of 2 to 10 grs.

The stomachic effects of cayenne have been long recognised, as seen in its free use as a condiment and appetiser in warm climates, and it is useful in *dyspepsia*, and invaluable as a tonic in *dypsomania*, in which 10 to 20 minims of the tincture may be given every two hours before meals. In *delirium tremens* large doses (30 grs.) often produce sleep. Locally, it is useful in the form of a gargle for *relaxed throats*. Concentrated preparations will redden the skin almost to vesication, but with much pain and burning.

℞. Tincturae Capsici ʒj.
Infus. Rosae Acidi ʒvj.
Aquae Destillatae ʒvj. misce.

Fiat gargarisma saepe in die utendum.

℞. Tr. Capsici ʒiij.
Spt. Ammon. Aromat. ʒiij.
Tr. Calumbae ʒj.
Tr. Card. Co. ʒvj.
Aquam ad ʒviij. misce.

Fiat mistura, signa. "A tablespoonful with the same quantity of water every two hours, or when the craving for drink comes on."

Carbo Animalis and **Carbo Ligni.**—The first is employed internally as an *antidote in poisoning by the alkaloids* morphine, strychnine, &c., with which, if given immediately afterwards, it combines, and renders their action harmless—½ oz. neutralising 1 gr.—but its administration should not interfere with the use of the stomach pump, emetics, and purgatives, which should follow.

Internally, wood charcoal is administered in *flatulent conditions of the stomach and intestines*, as an absorbent and deodoriser; it occasionally checks vomiting and the formation of gas, and stops fermentation and purges mildly.

Externally, charcoal acts as a powerful deodoriser and antiseptic, and, as such, may be freely applied to *putrid sores* and *gangrenous limbs*, or it may be spread on plates to sweeten the air of the sick room. These properties depend upon its power of absorbing and condensing in its pores gases like oxygen, which destroy the gaseous products of putrefaction by coming into direct contact with them. The charcoal poultice is an excellent application to *foul ulcers*. Animal charcoal may be given like the wood preparation, in teaspoonful doses in water. It should be freshly prepared or reheated before use, and administered in wafer paper.

Cardamomum acts as a warm stomachic, like ginger, increasing by its stimulating action upon the gastric surface the secretion of the part, and improving the appetite. Its local stimulating influence increases by reflex action the peristaltic movements of the intestines, and thus flatus is dispelled. It makes a good corrective addition to purgative medicines, and, as the tincture is of a bright red colour, compatible with most drugs (iron excepted), it is a prized flavouring and colouring ingredient, and medicine containing it has a better chance of remaining in an irritable stomach than if given alone.

Carui Fructus.—Its action is explained under Anethum, with which it is practically identical.

Caryophyllum — Cloves — when administered, act as a stomachic. This remedy resembles the previous two in its tonic, carminative, and stimulating effects. The essential oil is powerfully antiseptic; when applied to the terminal filaments of a painful and irritated nerve it acts as an efficient anodyne; hence its use in *tooth-ache* and in some cases of *superficial neuralgia*. Five drops on a little sugar speedily remove pain caused by accumulations of air in the bowel, by exciting reflex muscular contractions, driving the air forwards or backwards, relieving the over distention, and acting as a local anodyne upon the irritated nerves of the part.

Cascara Sagrada is, in large doses, an irritant to the gastro-intestinal membrane; in moderate doses (½ dr. liquid extract) it acts as a stimulant to the entire glandular apparatus of the alimentary canal, increasing slightly the *secretion* and markedly the *peristaltic action* of the intestine by stimulating the muscular fibres, and producing healthy copious evacuations. Smaller doses (5 to 10 minims) have a decidedly tonic effect

upon the stomach, like the vegetable bitters, increasing the appetite and mildly stimulating the liver. Casearа is, doubtless, the best remedy yet introduced for *chronic constipation*, and the dose can be so graduated that painless, soft natural motions are voided daily where constipation had been the rule for years. The dose can be gradually *diminished* while the good effects remain, and generally even in aggravated cases no augmentation of the dose is necessary. The liquid extract may be given in doses of ½ to 1 dr. night and morning for 4 or 6 days, when the morning dose can be reduced to a half or omitted. The solid extract may be likewise employed in pills. After a time the drug can be entirely withdrawn.

℞. Extracti Cascarae ℈. Liquidi ℥ii.
Tr. Nucis Vomicae ℥iii.
Glycerini et Aquae ad ℥iv. misce.
Fiat mistura cujus capiat ℥i. mane nocteque ad 4ᵗ vicem deinde omni nocte.

Cascarilla is an agreeable tonic, acting like Calumba, only it possesses decided aromatic qualities. It has feeble febrifuge properties, like cinchona, and the volatile principle which it contains may possibly act upon the respiratory mucous membrane. It is useful in *dyspepsia*, where a stimulating tonic is indicated, and when smoked in a pipe it is valuable as a *substitute for tobacco* when we wish to wean heavy smokers from their vice. Dr. Smith, in his commentary, gives the following formula for an acceptable tonic, useful in convalescence from fevers which often does good when other tonics are not tolerated:—

℞. Acid. Nit.-Mur. dil. ℥ij.
Tinct. Cinch. Co. ℥j.
Infus. Cascarillae ad ℥viij. misce
Capiat ℥ss. vel ℥i. ter in die.

Cassiæ Pulpa.—This preparation is very seldom used in medicine except as an ingredient in senna confection. It is a

mild laxative, like manna, and it probably acts by stimulating the peristaltic movements of the intestines.

Cataplasmata are used in medicine with different intentions: thus sinapis is a rubefacient, lini an emollient, conii a sedative, and carbonis and sodii chlor. antiseptic; but linseed is by far the most frequently employed. When a hot linseed poultice is applied to a part, the warmth causes the small vessels to dilate freely; the muscular elements in the skin, hair follicles, and gland ducts are relaxed, and thus the tissues get soft, and the tight feeling or tension of inflammation is reduced or passes away; the sensitive nerve endings experience less pressure by the blood being drawn to the surface. A warm poultice applied to the *inflamed hip joint* sometimes relaxes spasm of the muscles and diminishes the transferred knee pain.

Poultices should be as warm as can be comfortably borne; a very hot poultice will often aggravate pain and tension by acting as a direct local stimulant.

The question often arises, when should poultices be applied to local inflammations, as in a case of *whitlow?* A strange paradox may be observed here: if applied early, general relaxation of the tissue is the result, and the tension which is fatal to the life of a part is removed, and resolution is more liable to occur; but if inflammation has already progressed so far that the white corpuscular elements have wandered through the coats of the vessels, or a purulent collection has already formed, poulticing assists it materially in reaching the surface. Thus poultices, by making the part an internal one, are useful in *all stages of inflammation;* if applied early they prevent suppuration, and if used in the advanced stages they hasten or encourage it; and if an antiseptic quality existed in them, everything that is desired would be achieved. We have this desideratum in the spirit lotion when covered in with oiled silk.

Catechu is a valuable astringent, acting exactly like tannic acid (which see). It is given in *passive diarrhœas* and *hæmorrhages*, and is well suited for the treatment of such cases in children. It may be chewed before food in *pyrosis*.

(For Diarrhœa in a child 1 year old).

℞ Tinct. Catechu ℥iij.
Spt. Chloroformi ℥iss.
Mist. Cretæ ad ℥iv. misce.
Fiat mist. cujus capiat cochl. i. min., post singulas dejectiones liquidas.

Cera Alba, Cera Flava, and Cetaceum are seldom employed internally. When swallowed they act as protectives or demulcents, by covering over the gastro-intestinal surface from irritating secretions, and externally they are largely employed as emollients. Possessing bland, unirritating qualities, they are valuable in making the groundwork or basis of more active ointments or cerates. Spermaceti formerly was much employed as an expectorant, but it most probably is devoid of such virtue. It may be given beaten up with egg and warm milk.

Cerevisiæ Fermentum has been found a tonic stimulant in *fevers*, and was used by Dr. Stoker as such, in 10,000 cases, as mentioned by Neligan. It is a laxative and deodoriser, and prevents the decomposition of matters in the bowel; it has been given for *boils* and in *dysentery*. It is used now only as the yeast poultice, to correct the fetor of *putrid sores*, and this preparation seems to owe its efficacy to carbonic acid. It causes pain, and possesses no special advantages over other more manageable deodorants.

Cerii Oxalas is a gastric sedative, acting probably like bismuth. The Pharmacopœial dose is too small; 5, or even 8 grs., may be given. It was introduced as a remedy for the *vomiting of pregnancy*, but it is gradually falling into disrepute. It has been tried in *epilepsy* and *chorea*, with very doubtful results.

Cetraria is a feebly nutritious tonic, containing a considerable quantity of starch and a small amount of bitter principle. It is largely eaten as food by the Laplanders, and, by its demulcent properties, when made into blanc-mange, is useful to many *dyspepties*. It has been praised as an expectorant, but it is very improbable that the lichen has any action over the bronchial membrane.

Chirata is a pure bitter tonic, exciting very gently the secretion of the gastric juice, like calumba, gentian, and quassia, aiding digestion and improving the appetite. Its effects are best seen in the *atonic state of the stomach of drunkards* after a prolonged course of drinking, and it may be combined with bismuth or a mineral acid, the former if *nausea or vomiting*, the latter if a *furred* state of the tongue exist.

Chloral Hydras induces sleep identical in every respect with sound, natural, refreshing slumber, lasting 5, 6, or 8 hours, devoid of dreams, and free from stupor and narcotism, and not followed by gastric or other trouble. It does *not* act, as Liebreich—its introducer—supposed, by being decomposed in the blood into chloroform on meeting the alkali of the circulating fluid, since this is too weak to decompose it, and the odour of

chloral and not of chloroform is perceived from the breath; and, moreover, a corresponding dose of chloroform will not affect the system in the same way, being more decidedly anodyne than chloral.

Chloral does not markedly relieve pain, nor influence the nerves of sensation, in safe doses; hence if severe pain is present, chloral, unlike opium, will not relieve it, unless in doses just short of affecting reflex action, and, if the pain continue, probably no sleep will supervene. Reflex action is weakened and destroyed by large doses, the blood pressure falls from the vascular dilatation caused by paralysis of the vaso-motor centre, and the cardiac ganglia; the pulse and respiration are slowed; and if a still larger quantity is administered, loss of sensation, and deep coma occur. Death results from paralysis of the heart by its effect upon the cardiac ganglia, or stoppage of the respiration ensues through its action upon the respiratory centre. The *temperature falls markedly*, and Brunton found that this fall was so great as to alone cause death. The motor nerves or muscles are not directly affected, but the pupil is *contracted*.

Chloral is an excellent hypnotic in *sleeplessness, caused by over-work or worry;* but *delirium tremens* is the affection in which its virtues have been most prized. Given in 20 to 30 gr. doses it produces refreshing slumber; but it is in the early stage of the disease that it is most valuable. After the delirium has lasted several days the writer believes chloral to be a dangerous remedy, which must be used with great caution, if employed at all, the heart at this time being especially susceptible to its action. He believes that the use of chloral raises the mortality in this disease, and he now only uses it with fear and trembling when every other means fail, which is *very* seldom.

It is powerfully antispasmodic, and has been used with benefit in *infantile* and *puerperal convulsions, chorea, whooping-cough, asthma, sea-sickness*, and *acute mania;* and it is highly beneficial, and often curative, in *tetanus*. Playfair thinks that it relieves the early *pains of labour*, without directly hindering the uterine contractions.

Chloral should be given with great caution to patients with fatty hearts or atheromatous vessels; and as its hypnotic effects come on in a very short time (less than 30 minutes), and pass off as rapidly, it should be repeated inside an hour or two if the result is not produced, and the patient should always be in bed before swallowing the first dose. Externally it is a good Antiseptic, and a lotion of 8 grs. to 1 oz. is a painless stimulant to *unhealthy ulcers*, and often cures *eczema*.

Powdered chloral sprinkled over adhesive plaster, gently warmed and laid on the skin, makes a painless, speedy, and effective blister, superior to cantharides (Fauntleroy).

Chloral is an antidote to strychnine and Calabar bean.

℞. Chloral Hydrat. ʒij.
Potassii Bromidi ʒiij.
Syr. Aurantii Floris ʒj.
Aquam Menthae Pip. ad ʒvj.
misce.

Fiat mistura, cujus capiat unciam, hora somni et semiunciam omni hora ad effectum.

Chlorine, when inspired, acts as a powerful irritant, causing death from spasm of the glottis or inflammation of the air passages; greatly diluted with air it is a stimulating expectorant.

Externally applied, it is a rubefacient, but it is only used in medicine for its powerful antiseptic and deodorising properties. (See Calx Chlorinata.) Internally, the solution of chlorine has been recommended in *fevers*, on the strength of the zymotic theory of their origin; but its use is probably erroneous in such cases, as it becomes soon so diluted by the mass of the circulating fluid as to be rendered innocuous to the supposed germs, unless given in doses, which *weaken or paralyse the respiratory and other centres like narcotics.*

Chloroform is used in medicine as an inhalation to produce general insensibility, and is swallowed or applied externally as a remedy for various complaints. The vapour, when inhaled, gives rise at first to symptoms often differing widely in different individuals, and depending upon some peculiarity of the patient. Generally three stages may be observed:—

1st—The "Preliminary Stage," with some cough or suffocative feeling, exhilaration of spirits, sounds in the head, mental confusion, with congestion of the eyes and face, and symptoms resembling mild alcoholic intoxication. The sensibility is blunted.

2nd or "Struggling Stage," with marked mental or motor excitement and intoxication, acceleration of the pulse (from excitement), lividity of the face, greatly diminished sensibility, and dilatation of the pupils;

Rapidly passing into

3rd, The "Anæsthetic Stage," or state of complete narcosis, where there is total insensibility and muscular relaxation, with suspension of the cerebral functions, loss of reflex action, diminution of the force of the pulse, and contracted pupils.

The operator recognises this stage by lifting up a limb and it falls perfectly flaccid; by touching the conjunctiva, when no attempt at winking occurs; by exposing the iris suddenly to light after having the lids closed, and sluggish contraction follows; by pinching strongly the skin of a sensitive place, and not the slightest wincing is noticed.

If the inhalation is pushed further, death may occur. 1. By the *heart* becoming *directly* paralysed, through the influence of the chloroform on the cardiac ganglia; and this may happen at any stage, and often gives no warning. 2. The *respiration* is interfered with, so that death occurs through apnœa from the stoppage of the breathing, through the action of the chloroform on the respiratory centre, or on account of the tongue falling back, or vomited matter getting into the trachea.

☞ The pulse and respiration must be carefully watched and the failing of either met with the instant removal of the inhaler; and if there be asphyxia, the chin should be forcibly drawn away from the sternum, or the tongue drawn forward, or artificial respiration, which is the best remedy to rely upon, may be performed; the cold douche may be used at the same time. When the heart stops, the patient's head should be placed lower than his body, artificial respiration should be kept up, and nitrite of amyl, ammonia inhalation, and galvanism may be tried. Hypodermic injection of ammonia appears to the writer, from Brewer's experiments, to be the most promising treatment.

Brunton believes that death may be often the result of *shock*, and may be caused by too little instead of too much chloroform. He explains how death has so often followed the performance of trivial operations where deep narcosis is generally considered unnecessary. When no chloroform is administered, the stimulus to the sensory nerves produced by an operation, causes reflex contraction of the vessels and raised blood pressure which overcomes the depressing effect at the same time always produced upon the heart by reflex action, and all goes well; but when partial anæsthesia has been produced, reflex contraction of the vessels may be lost, whilst the

depressing reflex effect of the operation upon the heart may still remain, death from the shock of the operation following. When the narcosis is *deep*, both the reflex depression upon the heart and the reflex contraction of the vessels are absent, and the stimulus of cutting sensory nerves does not affect the heart one way or other. The importance of this explanation should be of great value as a guide in administering the drug.

Various inhalers are used. Clover's, which prevents the vapour reaching the lung in a more concentrated form than four per cent., is, perhaps, the best for those who are not familiar with the administration; but the open sponge or towel, with the chloroform dropped on it answers every purpose, and one dram will be enough to begin with. No food should be allowed for four hours previously, but the plan of starving for a longer period than this is to be condemned, as it leaves patients in a bad condition to resist the effects of hæmorrhage or shock, especially those with vigorous digestive powers, who are accustomed to the stimulus of food every four or five hours.

Chloroform should always be administered with great caution, but if there be fatty or other disease of the heart the caution should, if possible, be increased. There is hardly any state of the system in which the drug may not be used, and it may be administered at all ages, children, as a rule, bearing it well. The vomiting so often following its use may be to a great extent prevented by a previous hypodermic injection of morphine to which a little atropine has been added.

Under the head of Æther, the relative value of these two anæsthetics is spoken of, but there can be no such thing as relative value. If ether is proved to be, beyond all doubt, safer than chloroform, then it alone should be used; for all the minor disadvantages, such as its smell, tardiness, liability to cause sickness, &c., cannot be weighed in the balance against safety.

The following remarks by Dr. H. C. Wood appear to put the case of ether and chloroform very fairly:—"As an anæsthetic chloroform possesses the advantages of quickness and pleasantness of operation, smallness of dose, and cheapness. These advantages are, however, so outbalanced by the dangers which attend its use that its employment under ordinary circumstances is unjustifiable. It kills without warning, so suddenly that no forethought, or skill, or care can guard against the fatal result. It kills alike the robust, the weak, the well, and the diseased; even the previous safe passage through one or more inhalations is no guarantee against its lethal action. Statistics seem to indicate a mortality of about 1 in 3,000 in-

halations; and hundreds of utterly unnecessary deaths have been produced by the extraordinary persistence in its use by a portion of the profession. It ought never to be employed except under especial circumstances, as when a speedy action is desired in puerperal eclampsia, or when the bulkier anæsthetics cannot be transported, as in the field during war time." The death-rate in ether is about 1 in 16,000.

With many the A.C.E. mixture is a favourite remedy for producing anæsthesia; it consists of 1 part of alcohol, 2 parts of chloroform, and 3 of ether.

Chloroform inhalation is employed in surgical operations, *puerperal* and *uræmic convulsions*, during the progress of *gall stones and renal calculi*, and largely in *obstetric practice*, in which it is most decidedly, freer from danger than in any other class of cases, and the third stage of its action should never be experienced in labour unless where a difficult instrumental delivery is about to take place. The patient can be kept just upon the border of dreamland, without producing insensibility. In a host of spasmodic ailments, as *laryngismus*, *pertussis*, and *asthma*, the vapour of chloroform is highly beneficial, and often curative, and it is of great benefit to the physician in carrying out the *diagnosis of phantom and uterine tumours*.

Internally, chloroform in small doses acts as a gastric stimulant, rapidly followed by sedative effects, probably by affecting the peripheral nerves in the same way as a pure narcotic affects the great centres. It acts in this way when given in 1 minim doses, properly diluted, and relieves *gastralgia*, *vomiting*, *sea-sickness*, and *reflex headache*. From 10 to 20 minims affect the system, causing, after absorption, marked narcotic effects, and, if repeated, symptoms resembling those following its inhalation; administered in large quantities, undiluted, it acts as an irritant poison. From its effects upon the centres of sensation, it is useful as an anodyne, relieving pain, inducing sleep, and preventing spasm, and its influence is intensified when opium is combined with it. Cough is often relieved, and *hiccough* stopped by such a combination.

Externally, chloroform applied on lint to the skin, and quickly covered with oiled silk, acts as an irritant, occasionally producing vesication. If uncovered, or if diluted before being applied, it acts as a local anæsthetic by its influence over the endings of the sensory nerves, and hence it is useful in *neuralgia* and *odontalgia*, and often relieves the itching of *urticaria*.

Dr. Waller has shown that it greatly assists the absorption of many substances through the skin, the chloroform rapidly penetrating and carrying with it the dissolved substance. In this way morphine readily finds its way into the blood.

The "deep injection," as introduced by Bartholow, is a valuable method of subduing *neuralgic pain*. He injects 10 minims or more of chloroform through a hypodermic needle thrust deeply into the tissues surrounding the affected nerve.

Chrysarobin contains chrysophanic acid, and is itself frequently known as "Chrysophanic Acid."

It is a remedy whose value in chronic *psoriasis* can hardly be exaggerated. An ointment (of from $\frac{1}{2}$ to 1 dram mixed *intimately* with 1 oz. of heated lard or vaseline) rubbed twice daily into the scaly patches of this disease rapidly causes their disappearance. It frequently produces a painful erythematous inflammation of the surrounding healthy skin, which prevents its use in some patients. The writer, after considerable experience of chrysarobin, is satisfied that this need never occur if the application be confined exclusively to the diseased islands, *and not permitted to touch the healthy skin*. This little point he believes to be the secret of the success of the treatment. Dr. Fox has advised application of chrysarobin made into a paste with water, smeared over the spots, and covered with collodion.

There can hardly be any doubt now as to the way in which the remedy does its satisfactory work in this troublesome disease. It acts both locally and constitutionally. Its local action may be seen by rubbing the ointment into the diseased spots on one side of the body of a patient affected with psoriasis. In a week or ten days the skin on the side so treated shows decided signs of improvement not in the least apparent on the opposite, and as the diseased patches begin to disappear under the direct application of the remedy, those regions to which it has not been applied eventually begin to show signs of improvement also; and the writer found, by persistently continuing the application to the spots originally so treated, the entire surface of the body cleared up. This is probably caused by its absorption into the system and its conveyance to all the diseased areas. The experiment is a difficult one, however, owing to the difficulty of preventing the ointment being diffused over the entire cutaneous surface, and to the fact that the application cannot be too long continued, because an ointment which causes no irritation whatever for a few weeks, so long as the spot to which it is applied remains scaly and diseased, soon acts as a powerful irritant to the same spot as it becomes resolved and healthy.

This observation is strengthened by the experiments performed by Lewin and Rosenthal upon rabbits; they found that an ointment of chrysarobin, when applied externally, was

absorbed and partly converted into chrysophanic acid in the system; a part not oxidised was demonstrated in the urine.

In the same way success has followed the internal use of chrysarobin in *psoriasis*, *eczema*, *acne*, &c., but the writer found that sometimes its use in this way had to be abandoned, owing to violent griping, purging, vomiting, anorexia, and malaise sometimes coming on after doses as small as $\frac{1}{8}$ gr. in a pill. In one case the constitutional symptoms became alarming, and the temperature reached 103°. Chrysarobin is a powerful parasiticide, and has proved efficacious in *ringworm*, *tinea*, &c.

The deep purplish discoloration which it produces on the skin and bed linen are barriers to its use, and great care must be exercised in applying the ointment to the face, as it causes œdema of the eyelids, with discoloration, though it can be applied to the scalp (15 grs. to 1 oz.) with benefit.

Cimicifuga enjoys some reputation as a remedy in *acute* and *chronic rheumatism;* it often is of use in cases of *muscular rheumatism*, *lumbago*, *sciatica*, &c., and has been successfully used as a stimulating *expectorant* and in *chorea*. The drug in this country had fallen in estimation—the writer believes on account of its being kept too long, as it soon deteriorates. Large doses cause vomiting, vertigo, tremors, exudation from the bronchial mucous membrane, and a marked *diminution in the frequency of the pulse*. Small doses act as a cardiac tonic, like digitalis, while larger doses appear to affect the heart, as hellebore and aconite do.

It acts almost as powerfully on the uterus as ergot does.

Cinchona, Cinchonine, Cinchonidine, and Quinine—Cinchona differs from its alkaloids in possessing (1) decided astringent qualities, which it owes to the amount of tannic acid contained in it; (2) in being much more bulky—about 50 times; (3) in being more apt to cause local gastric irritation; and (4) in being longer in the stomach and canal before absorption.

The results of experiments outside the body demonstrate quinine to possess great power as a destroyer of the life of *minute organisms*. Less than 1 grain dissolved in 1 ounce of water will cause the instant death of active infusoria and fungi, and double this strength prevents or checks the alcoholic fermentation and destroys putrefactive decomposition, acting as an antiseptic, like carbolic acid. A lotion of 3 grs. to 1 oz. has been used with success in *diphtheritic ophthalmia*. Its costliness, however, is a barrier to its use as an antiseptic, but the powdered bark is occasionally applied to *foul and sluggish*

sores with great benefit, its astringent properties acting the part of a tonic, whilst the alkaloid checks putrefactive changes.

Single large doses of quinine, or moderate doses of 2 to 5 grs., frequently repeated, give rise to a group of unpleasant symptoms, called "cinchonism," viz.—ringing noises in the ears, or deafness more or less complete, partial blindness, headache, and delirium, with nausea and insomnia. These effects, Harley believes, are produced by the direct action of quinine upon the nerve vesicles, and they explain how "its beneficial influence is seen in those cases where the nervous system is unstrung—where, from sheer debility and relaxation of the nerve vesicles, the nerve currents are jarring and painful." Other observers (amongst whom is Binz) believe that cinchonism depends upon anæmia of the brain, while it has been asserted that congestion of this organ has to answer for the symptoms. Large doses frequently repeated cause an intensification of all these symptoms, with giddiness, dilated pupils, embarrassed respiration, convulsions, paralysis, stupor, and collapse. There is diminution of blood pressure from weakness of the heart and paralysis of the vaso-motor centre, loss of reflex action from its effect upon the cord, tissue change and oxidation are lessened, and the respiratory centre becomes paralysed.

In *febrile* conditions larger doses are tolerated without causing unpleasant effects. In Germany the sulphate of quinine is administered in fevers in 40 gr. doses, and seldom are any evil effects noticed. As much as 1 oz. has been taken without any serious results.

In small doses, quinine may be taken as the type of a tonic, increasing at first the activity of the process of secretion in the stomach, but after a time checking it: and if continued too long, or if the dose be increased, the digestion and appetite become somewhat impaired, and an irritated condition of the gastric mucous membrane results till the drug ceases to be administered.

Small doses have *no* effect on the pulse; moderately large doses (10 to 20 grs.) increase the number of pulsations, whilst slightly diminishing their power; and very large doses (40 to 80 grs.) cause cardiac depression, with great fall in the number of pulsations and in the tension.

In health, quinine appears (short of serious doses) to possess no influence over the body heat. In disease, however, full doses of the drug cause a steady diminution in the temperature when this is considerably above the normal standard.

Thus quinine ranks as an anti-pyretic, and various ideas prevail as to how it acts in these *febrile* affections. Its influ-

enee over the cireulation does not account for it, and it is not probable that it exereises its beneficial effects solely by its direct action on tbe nervous system.

Professor Binz believes that quinine in *febrile diseases* "acts by directly combating the efficient cause of tbe disorder, and by checking the abnormal metabolism going on in the body, the nervous system taking no part, or only a seeondary part in the operation." It is possible that quinine prevents the growth of the lower organisms like ferments, which have been found to exist in the blood, and whieh many believe are the direct cause of the febrile condition. To do so outside the body would require contact with a solution of sulphate of quinine of the strength of at least 1 in 900; and after, say half a dram of this drug was administered, assuming it all to be absorbed and retained in the blood, a solution of not more than $\frac{1}{3}$ this strength would be operating upon them. Though this of itself would appear by direct experiment to be unequal to the task of destroying protophytes, it might be mueh more than enough for the destruetion of organisms living in a vital fluid, which is itself antagonistic and unfavourable to their existence.

Quinine has been proved to possess a peculiar power over tbe movements of the wbite corpuscles of the blood, and it is supposed in this way to reduce the size of the spleen in ague, and check inflammations in their first stage. (It is by no means clear that quinine *does* reduee the enlarged spleen.)

The red eorpuscles are inereased in size, but are prevented from exercising their oxygen-carrying functions by large doses of this drug, and increase is observed in the quantity of nitrogen in tbe urine in fevers.

Large doses (20 grs.) cause unmistakable eontraction of the gravid uterus.

It is in the treatment of *intermittent fever* that quinine is so valuable, for not only will it rapidly cure the disease, but it also affords proteetion to those healthy subjects exposed to the malarial poison. Its action here has been long believed to depend upon its destructive power over the minute organisms, whieh there is fair reason to believe are the cause of *ague*, and which have been found in the blood and tissues of the subjects of malarial poisoning.

In the milder forms of *ague* the best method of administering quinine is to give it in small doses four or five times a day, but in maliguant attacks it must be pushed in large doses. Some give 10 to 20 grs. one hour before the fit, but half this quantity may be regularly given every six hours in bad casès. Bartholow

believes the best rule is to give 10 grs. during the sweating stage, and repeat it five hours before the next paroxysm.

The use of the drug should be continued for a time after the disappearance of symptoms, and if the stomach will not tolerate it, it may be given by the rectum or injected under the skin with the ordinary hypodermic syringe, a solution in ether affording the most elegant and harmless form for injection.

In *remittent fever* quinine may be given in moderate doses during the remission, but it is advisable to give one full dose (10 to 15 grs.) at once without waiting for the remission.

Besides its use as an anti-pyretic remedy in *typhoid, typhus, variola, pneumonia*, and *acute rheumatism*, it has been employed with marked benefit in *various septic states*, and in *pyæmia* and all exhausting suppurative conditions. The theory that it acts beneficially in disease by destroying minute organisms has led to its advocacy in *whooping-cough, intermittent hæmaturia, hay fever*, &c.

Quinine has been proved to be valuable in various forms of *neuralgia*, especially in those with well-marked periodic exacerbations of pain, and in the *anæmic*, and in those suffering from prolonged worry and mental overwork. It should be given in 5 to 10 gr. doses, at bed-time, with a full opiate.

It has been recommended in *chronic suppurative bronchitis*, but the writer has found it often to increase the difficulty in coughing up the expectoration; intelligent patients complain of this, no matter how the drug is disguised. It is probable that it exercises some toxic effect upon the cilia in these cases, which necessitates the respiratory muscles and bronchial tubes discharging the duty often silently performed by the cilia: at the same time the secretion is diminished in amount and increased in viscidity, but not to an extent sufficient to account for the distress often following its use.

The greater part of the quinine administered passes out of the body in the urine, the elimination lasting several days; some probably remains in the system; traces of the alkaloid have been found in the secretions of the skin, salivary glands, and intestines. Iodide of potassium solution holding free iodine affords an easy method of showing its presence in the urine by causing a brown precipitate, the reaction may be demonstrated within 40 minutes after the quinine has been swallowed. It has been fancied that this drug produces many of its almost magical effects by acting as a *restorative*, and supplying to the blood some substance identical with one which is believed to form a natural component of the body, and upon the absence of which the disease is supposed to depend.

Cinchonine and Cinchonidine appear to act very much in the same way as quinine, but not so powerfully; they depress the heart more than quinine does.

The *decoction* of bark is an inelegant and unstable preparation, though, perhaps, the favourite. The *infusion* is by far the best form in which to administer cinchona elegantly and cheaply. It contains a higher percentage of alkaloids in proportion to the amount of bark used. The *new official liquid extract* is a great improvement upon the older preparation. Its use has been lauded in *dipsomania*.

The *tincture of bark*, in tea-spoonful doses, is a very proper way in which to order cinchona.

Quinine may be given in powder, pill, mixture, or solution. When a large dose (say 10 to 20 grs.) is to be given, by far the best way is for the physician to order it to be taken in wafer-paper; 20 grs. may be folded up in a disc of moistened wafer-paper, and swallowed like a spoonful of soft food, without the least inconvenience.

It is not necessary, as is often supposed, to order quinine in solution; the acid of the gastric juice causes it to be speedily dissolved and admitted into the blood; and the following agreeable, though not very attractive, formula may be used, and will not be found so bitter as a *solution* of the alkaloid :—

℞. Quininae Sulphatis gr. xxxvj.
Syrupi Aurantii ℥j.
Tincturae Aurantii ℥j.
Aquae Destillatae ℥x. misce.

Fiat mist. cujus cpt. ℥ss. ter in die ante cibos, phiala prius agitata.

Honey and tannin cover the taste of this drug.

℞. Quininae Sulphatis gr. xxxij.
Glycerini Acidi Tannici ℥i.
Syrupi Aurantii Fl. ℥iij. misce.

℥i. ter in die, p. p. a. ex aqua.

The tincture of quinine, in teaspoonful doses, is an agreeable and effective way to administer small quantities.

The combination of bark with a mineral acid cannot be more effectively produced than in the following excellent tonic:—

℞. Tinct. Cinchonae ℥iss.
Spt. Chloroformi ʒiv.
Ac. Nitro-Hydrochlor. Dil. ʒiv.
Syrupi Aurant. ad ℥iv. misce.
Fiat mistura, cujus capiat cochlear. i. minim, ex paululo aquae ante cibos.

Cinnamomum is a warm aromatic, acting as a true stomachic by a gentle stimulating action on the gastric membrane, increasing its secretion and assisting digestion; hence its use as a condiment. It contains a small quantity of astringent principle, which renders it more useful in *diarrhœa* than a mere flavouring ingredient, and by some it is even thought to be of use in *pulmonary hæmorrhage*. It also contains some principle grateful to the stomach, which often assists it in overcoming *nausea*, or even *sea-sickness*. The essential oil is a stimulant, and 4 minim doses will relieve *flatulent distention*, and a smaller quantity corrects the *griping of purgatives*.

Coca and Cocaine—Physiologically studied by Niemann, Schroff, Frend, Hughes Bennet, and others, but recently introduced into medicine as a Local Anæsthetic by Koller, has speedily established itself as one of the most valuable remedies in the Materia Medica.

The action of coca leaves, or their alkaloid, when taken internally in small quantity, is stimulating like caffeine, brightening the intellectual faculties, lessening fatigue, quickening the pulse, and acting as a general tonic. In larger doses a group of symptoms like cinchonism is seen, with loss of mental controlling power, giddiness, and unsteady gait. In larger doses the hemispheres, medulla, and cord, at first stimulated, are weakened and finally paralysed. The *sensory columns of the cord* suffering, whilst the motor escape, the blood pressure falls, the temperature rises, and death results from paralysis of the respiration.

The recent experiments of Tumas show that *direct* application of cocaine to the psychomotor centres of the dog in-

variably produced a fall of their excitability, and when painted over the cerebral cortex prevented epileptic fits; the dura mater was rendered insensible in a similar way. Large doses produced convulsions from irritation of the medulla.

A few drops of a 4 per cent. solution of the alkaloid applied to the eye in a few minutes deprive the conjunctiva of all sensibility, so that squint, cataract, iridectomy, and even the operation of removing the eyeball can be painlessly performed; the range of accomodation is shortened and the pupil dilates.

The same remarkable anæsthetic effect is produced when applied to the mucous membrane of the nose, mouth, palate, pharynx, larynx, vagina, os uteri, anus, and rectum. Though less than ten months have elapsed since its effect upon the conjunctiva was discovered, a large volume might be filled with the details of minor operations performed under its benumbing influence. Solutions of various strengths have been used, 4 per cent. for the eye and 20 per cent. for the nose, mouth, and larynx; and $\frac{1}{4}$ gr. injected into the neighbourhood of buboes, inflamed bursæ, small tumours, abscesses, &c., permits them to be painlessly dealt with. Murrell has obtained good results by an inunction of 20 per cent. in oil of cloves over the course of neuralgic nerves. Dr. L. Owen by mixing an 8 per cent. solution with the official atropine solution obtains an effective remedy for all *painful and inflamed conditions* of the *conjunctiva* and *cornea*, and Dr. Bradford, of Boston, finds by adding $\frac{1}{2}$ gr. of pilocarpine to 1 dr. of a 4 per cent. solution of cocaine that all the anæsthetic effect is produced without affecting in the slightest degree the accommodation.

For *hay fever*, *pruritus* of the *anus* and *labia*, *vaginismus*, *fissure* and *ulcer* of the *anus*, its use has been followed by relief, and it promises well in aural practice also.

The way in which cocaine acts in dilating the pupil cannot be yet regarded as demonstrated, though it is probable that it acts by irritating the endings of the cervical sympathetic distributed to the dilator muscle, as maintained by Jessop. Snell has observed the interesting fact that a pupil dilated by cocaine contracts under the administration of ether and chloroform, which proves that it acts in a way different from atropine, whose mydriatic effect is not influenced by these anæsthetics. Cocaine is antagonistic to morphine, and its internal use is advocated in the treatment of *opium eating*. The liquid extract of the leaves is a valuable tonic stimulant and restorative in various forms of *nerve exhaustion*.

Coccus—The cochineal insect and its preparations are simply colouring agents, there being no reason to think that

tincture of eochineal has any effect whatever in *whooping-cough* or other *spasmodic affections*. Its beautiful carmine colour is turned purple by alkalies.

Codeina—This opium alkaloid possesses feeble narcotic powers, and may be taken in doses of 10 grains without producing sleep. Brunton found that it expended its force upon the nerves of the *viscera*, whose irritability it lessened to such an extent "that after its administration, irritant poisons like arsenic produced neither vomiting nor purging." It increases the irritability of the cerebral motor centres. Owing to its power over the visceral nerves it has been found very useful in soothing *the cough of phthisis*, and in lessening materially the amount of sugar in the urine in *diabetes* in those cases where, as Bernard pointed out, the glycosuria was depending upon some peripheral irritation of the vagus.

It has been given with advantage in sleeplessness caused by pain in some peripheral regions, and in nausea, where 2 to 4 grains may be given every 4 or 6 hours till sleep is produced.

Colchicum in small doses is absorbed, and by the blood is supplied to the different glands in connection with the gastro-intestinal canal, which it excites to increased activity, and these effects are produced either by its introduction under the skin or into the stomach ; the gastric juice and pharyngeal mucus are increased, and the bile augmented (its salts being more plentiful), and marked increase in the intestinal fluid occurs. In large doses, vomiting, purging, tenesmus, and inflammation result, and death occurs from irritant poisoning—the sensory nerves being paralysed, while the motor nerves are but very slightly if at all weakened.

As a diuretic its action is most uncertain, and as a purgative its effects are too severe. Well-marked sedative influence on the heart and general circulation follow its administration, though this is largely reflex.

It is as a remedy for *gout* that colchicum is used in medicine, and often very wonderful effects follow its administration, pain subsiding promptly, swelling disappearing, and the attack often vanishing after one or two doses. Some, however, believe that it is in no way curative, the relief being dearly bought, the pain returning with greater severity.

How it acts in these cases of *acute gout* it is not, in our present knowledge, possible to answer ; but we know it is not by exerting its purgative or questionable diuretic properties, since its good effects are constantly seen without either catharsis or diuresis being produced, though it acts better in conjunction with purgatives.

Paris noticed that alkalies softened its action, while acids rendered the drug more irritating.

Magnesia makes a favourite corrective. The wine of colchicum is the best preparation for ordinary administration.

It has been advocated in all the protean forms of gout, or in almost every disease occurring in gouty persons. 15 minims of the wine may be given every 6 hours. The same plan may be adopted in the acute variety of the disease, though it is better to give a full dose—say 1 dram—of the wine, and repeat it in two, three, or four hours while pain lasts. In *acute rheumatism* its utility is very doubtful.

Colchicum, from its stimulating action upon the liver, may be given advantageously with other *purgatives*, and the addition of a few grains of blue pill and coloeynth make a very valuable purgative for gouty patients.

The following is a modification of Scudamore's white mixture :—

℞. Vini Colchici ℥vj.
Magnesii Sulph. ℥j.
Magnesii Carb. ℥ij.
Aq. Menth. Pip. ad ℥xij.

Fiat mist. sumat cochlearia duo ampla quartis horis, p.p.a.

Collodium and Collodium Flexile are only intended as external applications. When a little is brushed or dropped upon the skin the ether evaporates, leaving behind a thin film impervious to moisture. This contracts as it becomes more solid, until it puckers up the surrounding skin, and, by its pressure, partly empties the vessels of the part. It is generally used as a protective coating for *fresh wounds*, excluding air and all external sources of irritation, putting the wound almost in the same condition as an internal part, thus hastening repair. It is, however, used for its contractile properties sometimes, as in the treatment of small *nævi*, *port-wine marks*, *entropion*, &c., where it both diminishes the blood in the cutaneous vessels and gives firm support. Dr. McKeown uses it with advantage in *relaxed membrana tympani*.

It is found that a layer of Collodion possesses *electrical* properties, and thus affords a method of producing feeble doses

of static electricity—the film is *negatively* charged as soon as it dries, and it has been used to relieve *hemi-anæsthesia*.

The flexile collodion does not contract so much as the other, but is much less liable to crack with the movements of the skin. It is an excellent application to *erysipelatous* surfaces. Corrigan recommended it as a remedy for *nocturnal incontinence of urine*, painted over the child's prepuce at bed-time; and it has been successfully used to cover the face in *small-pox* to prevent pitting, and as an application to *fissured nipples*. Nowhere, however, are its good effects so strikingly seen as in the treatment of *scalp wounds*—incised, lacerated, and contused—as it dries, by its contractility, it draws the edges of the wound together, prevents the admission of air, and does away with the necessity of a bandage. Collodion has been recommended as an application to sprains, and appears to prove a useful treatment, especially where the sprain is complicated with an open wound. It may be used to paint over the painful joints in rheumatism. The vesicating collodion is an elegant and effective preparation whereby the blistering properties of cantharides may be utilized.

Colocynthis is an active purgative, causing copious watery motions, whether swallowed or injected; it enters the blood, from which it is eliminated by the intestinal glands, which it stimulates, increasing their secretion, and hastening the vermicular contractions of the bowel, making them painful and irregular. In large doses it acts as a violent irritant to the canal, and may excite fatal inflammation or disturb the functions of the abdominal organs by reflex action, and thus produce abortion, &c. It is seldom given alone, on account of its drastic properties, but is a valuable addition to aloes and scammony.

Extract of hyoscyamus greatly relieves the griping caused by colocynth, without detracting from its purgative properties. The compound pill is a valuable purgative in *constipation of long standing*. It acts like aloes on the colon and (in full doses) on the liver, and it is feebly diuretic.

℞. Pil. Colocynth. Co. gr. iv.
Ext. Hyoscyami gr. ½.
Ext. Belladonnae gr. ⅓.
Resinae Podophylli gr. ¼. misce.

Fiat pil. mitte tales xii. ut. i. nocte.

Conium—The effects of this drug have been carefully studied, and the researches of Fraser demonstrate that the discrepancies in the results of the various observers are owing to the presence of methyl compounds of coniine in the different preparations experimented with.

Hemlock has no action upon the intellectual faculties, the physiological effects begin to show themselves within half an hour after swallowing half an ounce or an ounce of the succus. Vision becomes a little affected by a paralysing influence on the third nerve, which causes slight drooping of the lid, slight dilatation of the pupil, and impaired movement of the eyeball, followed soon by general diminished motor power, as is seen in a wearied, unsteady gait. If a larger dose be now administered, the diminution of motor power is intensified, and the patient is unable to move, the knees bend on standing, the pupil becomes more markedly dilated (though it is never widely so), and vision gets more confused.

Still larger doses being given, complete paralysis of the *extremities of the motor nerve trunks* ensues, swallowing and phonation become impossible, and finally death occurs from asphyxia through paralysis of the respiratory apparatus.

Hemlock has been used in *mania*, *chorea*, and *paralysis agitans*, its value depending on its depressing influence over the extremities of the nerves distributed to the restless muscles. In *whooping-cough* it is also serviceable; in *tetanus* its value is doubtful.

In spasmodic affections, like *laryngismus* and *convulsions* occurring during *dentition*, hemlock may be advantageously given, but it must be administered very freely. The only reliable preparation is the succus, which should be given in doses of 2 to 6 drams every three or 4 hours, and little benefit may be expected till the physiological effects of the drug are noticeable—a slight disturbance of vision and gait. Ringer gave 7 drams hourly to a choreic child; and children can bear large doses well, as a rule. A child one year old should get more conium in proportion than an adult; 10 minims to begin with is a maximum dose of the succus. It should, however, be rapidly increased, watching the effects. When any difficulty of swallowing is observed, the use of the drug should be suspended.

Hemlock sometimes helps the absorption of *effused inflammatory* products; and formerly it was classed on this account as a *solvent*, *deobstruent*, or *absorbent*, and it probably possesses some power through its influence on the nervous system.

Externally, hemlock is supposed to act as a sedative by paralysing the sensory nerve endings, hence the official cata-

plasm. It is, however, very doubtful that the drug possesses any local anæsthetic action. The official inhalation has been praised as a local remedy in irritable conditions of the *larynx*, *bronchial tubes*, and *trachea*, and has been used to soothe the pain in *tubercular laryngitis*, to quiet the cough in various forms of pulmonary disease, and in *asthma*, *pertussis*, &c. Its efficacy is very doubtful.

Copaiba.—After reaching the stomach, copaiba acts as a mild irritant to the mucous membrane, and in large doses excites nausea, vomiting, griping, purging, and sometimes strangury, with bloody urine. It seems to act on mucous membranes only, and it is mainly for its effect upon the lining of the urinary tract, especially its urethral part, that it is used in medicine.

Given in *gonorrhœa*, it at first slightly increases the flow, and afterwards controls it. It would almost seem that it acts by destroying the specific poison which causes the inflammation. It is eliminated by the kidneys as glycuronic acid, which gives a precipitate with nitric acid, which is soluble by heat; and it is eliminated also by the bronchial membrane and skin—all of which excretory organs are stimulated by it. It increases the watery element in the urine, and is used sometimes as a diuretic in dropsies of hepatic origin.

That it acts by direct contact in *gonorrhœa* and *gleet* is probable, because the writer has found great benefit from injecting it into the bladder in *inveterate cystitis* in the female. He dilutes it with its own bulk of warm castor oil, and injects 1 oz. of it, allowing it to remain until expelled. In *acute inflammations of the bladder* or *urethra*, copaiba often aggravates if given too early. If warm water injections be used for two or three days at first, copaiba will be found more effective afterwards. It should not be given in larger doses than 30 minims, and often this dose upsets the stomach.

In *chronic bronchitis* with profuse expectoration, copaiba often acts splendidly, and will be found in such cases the most reliable of the oleo-resins. It is occasionally used in *leucorrhœa*, and has been known to remove *psoriasis*, which resisted all remedies. It should be remembered that its administration sometimes brings out a profuse rash not unlike measles, or urticaria, and this probably gives some explanation of its use in psoriasis, acting as a stimulant to the skin. It may be given alone, in water, or in the form of an emulsion with mucilage, egg, or liquor potassæ, or in a gelatine capsule, or in a paste or pill with enough carbonate of magnesium to give the required consistency, and flavoured with oil of cloves or peppermint.

By far the best form to prescribe copaiba will be seen in the receipe for the paste under Cubebs.

(Gonorrhœa Mixture.)

℞. Copaibæ ℥vj.
Liq. Potassæ ℥iij.
Mucilaginis ℥j.
Spt. Ether. Nit. ℥iij.
Aq. Cinnamomi ad ℥viij. misce
fiat mist. capiat cochlear. i. mag.
ter in die. p. p. a.

Coriandrum.—An aromatic carminative, identical in its effects with Anethum and Anisum (under which heads its action is explained). 4 minims of the oil may be given on sugar, for *colic*.

Creasotum possesses many properties in common with Acid. Carbolic. (which see). It is speedily absorbed on entering the stomach, and does not undergo any marked change in the blood. It is eliminated by the bronchial mucous membrane, which it stimulates, thus becoming a valuable expectorant, especially if there be any fetor of the secretion. In full doses it is most valuable as an expectorant in *chronic basilar cavity*, no other remedy appears to equal its efficacy in this intractable affection. It also passes off in the urine, and is believed by some to be diuretic, though this action, is only to be relied upon in doses which are bordering upon dangerous. In very large doses, it is a violent irritant poison, resembling carbolic acid, only it does not produce convulsions, and does not render the blood less coagulable.

Small doses have a sedative action upon the terminal nerve filaments distributed to the gastric mucous membrane, and correct *nausea*, *gastralgia*, and *vomiting*, whether caused by local mischief or of a reflex character, as in *sea-sickness* or *pregnancy*. 2 or 3 minims frequently arrest *fermentative* and *putrefactive changes in the stomach*, for creasote, like carbolic acid, is a powerful antiseptic. It may be given in pill or in a mixture, and it is to be remembered that it explodes when combined with oxide of silver in the pilular form, unless it is previously diluted with some inert powder. (Page 53.) Externally, it acts like carbolic acid, and relieves the pain of an *exposed dental nerve* effectually; and in the form of the ointment it is useful in *ulcers* and the *scaly skin* affections where

tar is indicated, and it relieves the itch of *eczema*. As an inhalation in *chronic bronchitis* and *gangrene of the lung*, creasote is beneficial.

℞. Creasoti min. xij.
Pulv. Sapo. Castil. gr. xv.
Micae Panis gr. xxx. misce.

Divide in pilulas xii. e quibus sumatur una ter in die.

Creta and Creta Præparata are mild antacid remedies, useful where we wish to reach the *intestinal* surface with an alkali. (Their action is explained under Calcium Carbonate.) The aromatic powder is a valuable remedy in the *diarrhœa of childhood;* it may be given as a powder or in a mixture.

(For a Child 4 years old.)

℞. Pulv. Cretae Aromat. ʒij.
Syrupi Simplicis ʒj.
Spt. Chloroformi ʒj.
Aquam ad ʒiij. misce.

Fiat mist. sumat. cochlear. i. minim. tertiis vel quartis horis, p. p. a.

Crocus—Saffron may be said to be only used now for its colour and flavour. It was much esteemed long ago as an emmenagogue, and was believed to possess the property of increasing the rash in the *exanthemata*.

Croton Chloral. (See Butyl Chloral Hydrate.)

Crotonis Oleum is a powerful drastic or irritant cathartic, causing copious watery motions often in less than one hour after a medicinal dose. It does not act entirely as a local irritant to the intestines, as was supposed, but a part of it may be absorbed, and entering the blood, circulates with it till it reaches the intestinal glands, which it stimulates to increased action, and it quickens the peristaltic movements. The same effects follow

its application to the skin with friction as are observed after swallowing it. In large doses it is a violent poison, acting as a local irritant, and causing inflammation of the digestive tract, or death from collapse. Its rapid and generally certain action renders it a valuable purgative, where time is a consideration, as in *head injuries*, *acute mania*, *delirium tremens*, and *brain diseases*, and in very *obstinate constipation*, when we are sure the lower bowel is freed by enemata. It may be given in pill, 1 minim frequently acting as an efficient cathartic; or in *apoplexy*, it may be dropped on the tongue, when power to swallow is blunted or lost. (This is not, however, to be recommended.) It may, in such a case, be rubbed up with about 5 grs. of sugar, and placed on the root of the tongue; it may be mixed in ordinary cases with castor oil.

Externally, croton oil is a strong irritant when applied to the skin, bringing out an eruption, at first papular, but soon passing into pustulation. It is not, however, as painful a counter-irritant as might be expected. The linimentum crotonis cannot be improved upon where the drug is indicated as a rubefacient, and will be found useful as an external application in *acute bronchitis*.

The local application of croton oil to *ringworm of the scalp* has been successful in the hands of some.

℞. Olei Crotonis m. iv.

Pulv. Glycyrrhizae gr. xxx. misce.

Fiat pil. viii. st. i. sextis horis ad effectum.

Cubeba resembles Copaiba in its action, and possesses a stimulating and alterative influence over the genito-urinary mucous membrane and rectum. Its use is confined to the early stage of *gonorrhœa*. Made into a paste with copaiba, and a little nitrate of potassium added, it can be bolted in wafer paper in doses the size of a hazel-nut, when it will be found the best routine treatment for this disease. The same paste will often give relief in *bronchitis with profuse expectoration*, when other measures fail; and it is an excellent remedy for *piles*, if made into a paste with *glycerine*, and bolted in a similar way.

The official oleo-resin has more decided diuretic action than the powdered drug.

℞. Pulv. Cubebae ℥ij.
Pulv. Potassii Nit. ℥ij.
Pulv. Doveri ℥ss.
Copaibae q.s. ut fiat
Electuarium durum, ℥i. ter die sumendum post cibos.

Cupri Sulphas given in small doses (½ gr.) acts somewhat like the lead and silver salts. It has nervine tonic properties, and has been given in *epilepsy*. It is a strong astringent, and is used in chronic *diarrhœa*. In larger doses (5 to 10 grs.) it is a speedy emetic, acting like sulphate of zinc, in formidable *poisoning* cases, and in larger doses it is a powerful irritant poison.

Recently copper has been used on the Continent in the treatment of *enteric fever*, and, it is alleged, with great success.

Externally, it is a valuable astringent, appreciated in veterinary practice, and the powder dusted over *sluggish sores* destroys unhealthy granulations, and it is a powerful local stimulant. 3 grs. to 1 oz. water make a lotion which may be applied to *chancres* and *ulcers;* or injected into the urethra in *gleet;* or into the vagina in *leucorrhœa;* or brushed over the lids in *ophthalmia tarsi*.

Its prolonged administration stains the gums or teeth with a blue or green line like that seen in cases of *lead-poisoning*. It is eliminated by the skin, kidneys, mucous membrane of the gall bladder, stomach, and bowel, and may be found for a long time in the liver.

Cupri Nitras is one of the additions to the new B.P., and a valuable addition beyond doubt. It is only used externally. Owing to its deliquescent properties it soon becomes, upon slight exposure to the air, a styptic caustic liquid, which in the hands of the late Sir P. Crampton and Prof. Macnamara has yielded good results as a caustic to *syphilitic ulcers* upon the genitals, mouth, and tongue. It differs from the sulphate in exciting a stronger, healthy, or alterative action in the tissues around the ulcer after its destruction. It may be used in dilute solution 2 minims of the liquid to 1 oz. water as a detergent lotion.

Cusparia is a tonic possessing aromatic and febrifuge qualities. In large doses it causes vomiting and purging, but

in medicinal doses (30 grs. of the powder) it is useful in the *fevers of the tropics*, and in the *dysentery* of our own country, though it is almost devoid of astringency. Its value is seen in the treatment of some cases of *intermittent fever* where cinchona or its alkaloid cannot be borne.

Cusso, when taken in large doses, sometimes causes both vomiting and purging. Its efficacy in medicine, as a remedy for *tænia solium* and *bothriocephalus* does not depend upon this action, for in the doses usually given it does not often purge, but kills the parasite by direct contact.

2 to 4 drs. of cusso infused in 4 oz. of boiling water, and swallowed without straining, are taken for one dose; and, like many other vermicides, it acts more certainly if given when the stomach and intestines are empty, and if followed soon after by a mild purge; the worm is expelled dead, and often in small fragments.

Digitalis is a tonic and stimulant to the heart. Small doses lengthen and strengthen the ventricular contractions, raise the blood pressure and slow the pulse by stimulating the vagus roots, and the peripheries of the cardiac nerves. Moderately large doses increase the frequency of the pulse by paralysing the vagus roots, the blood pressure still rising. Larger doses cause irregularity of the heart's action and pulse by their effect upon the heart itself, and if the doses be repeated the blood pressure falls and the heart becomes finally paralysed, the respiration previously having been also weakened, though the motor and sensory nerves, cord and cerebrum remain unaffected.

Brunton asserts that the main cause of the increased blood pressure is not to be accounted for by the increased action of the heart, but by the *contraction of the arterioles* throughout the body. It acts as a diuretic mainly by raising the blood pressure in this way; its diuretic action is, however, slight in health but marked in heart disease.

Digitalis, on account of this strengthening action on the heart, may be given in all cases of *weakened contraction from valvular disease except one*. It acts in valvular disease by slowing the heart's movements, so that the overburdened ventricle or auricle gets longer time to contract, and thus more effectually drives the blood through a narrowed orifice. In the case of *mitral obstruction* the time during which the blood flows from the distended auricle into the ventricle is increased, and when the former contracts it has less to expel, and hence does its work better. The exception to its use is in the *early stage of aortic regurgitation*, where, after each contraction of

the heart, the blood, which should be forced along the aorta, finds its way back into the wearied ventricle, breaking upon its repose. If the diastole is prolonged by the digitalis, the duration of this backflow is increased, the mischief is aggravated, and grave danger may result. Later on, however, when the pulmonary circulation is affected, and through it the right ventricle becomes implicated, digitalis may afford relief. It should not be given in extensive atheromatous disease of the vessels, nor when there is much fatty degeneration of the heart muscle. Ringer points out that "the irregularity of the pulse is the capital indication of the necessity of giving digitalis," and it is often valuable in palpitation and irregular action of the heart not depending upon valvular disease.

Sansom says: "Digitalis is *facile princeps* of drugs in the treatment of imperfect compensation. It so influences the cardiac ganglia as to induce a more perfect contraction of the ventricular muscle, and hence a more complete emptying of the ventricles; whilst, at the same time, by an action on the vaso-motor centre, it causes contraction of the arterioles and a heightened tension in the arterial system. It slows the heart by lengthening the diastolic pause; so not only does it give rest to the wearied cardiac muscle—but as this muscle is nourished only during such diastolic pause by the blood which then enters through the coronary arteries—it directly ministers to its nutrition."

It has been highly recommended in *delirium tremens* in half-ounce doses of the tincture, where its sedative effects (apparently owing to changes in the cerebral circulation from the arterioles being diminished in calibre) have been in the hands of some followed by good results. This plan will not be adopted by the discreet physician until all others fail, especially as this is a disease in which a sudden wind-up occurs without warning. It sometimes decidedly reduces the temperature in *inflammatory conditions*, and as an anti-pyretic is still occasionally used on the Continent.

Digitalis has been recommended in *internal hæmorrhages*, because of its contracting influence upon the arterioles, but it is very uncertain. It has decided power in causing the contraction of the *uterine muscular tissue*, and may be used in *menorrhagia*.

In disease, the diuretic effects of this drug are often astounding. Given to relieve the *kidneys*, where many quarts, or even gallons, of fluid are shut up in the peritoneal cavity or thorax, from an obstructed cardiac circulation, it has been seen to increase the scanty urine from several ounces to as many pints in twenty-four hours. In these cases it clearly acts by striking

at the cause of the dropsy, through its power of raising the blood pressure in the renal glomeruli.

After the disappearance of the dropsy it has very slight power of increasing the amount of water or urea eliminated.

Digitalis, when administered for some time, occasionally without warning and with alarming rapidity produces symptoms of poisoning as if one large and dangerous dose had been taken. This is spoken of as the *cumulative* action of the drug, and it arises from its elimination by the urine being retarded. When the blood pressure rises very high the excretion of urine stops and the drug consequently accumulates rapidly in the blood. This may be prevented by keeping the patient strictly confined to the recumbent position, watching the urine and stopping the administration when this secretion becomes scanty.

Externally, an infusion applied to any extensive surface is readily absorbed, and will often effectually act as a diuretic, and will relieve urgent *bronchial suffering* depending upon heart disease.

The *infusion* appears to be the best preparation where the *diuretic* action of the drug is required, and the *tincture* where its cardiac tonic effect is desired. Brunton explains this by the different solvent effects of the water and spirit upon the active principles contained in digitalis.

The following pill is very efficacious in *cardiac* dropsy :—

(Guy's or Baly's Pill—modified.)

℞. Pulv. Digitalis
Pulv. Scillae
Pil. Hydrarg. ana gr. j. misce.

Fiat pil. mitte tales xx. ct. i. ter in die.

Tinctures of digitalis and iron go well together, notwithstanding they are so-called incompatibles; the iron is invaluable in combating the anæmia so common in heart affections.

Elaterin, Elaterium, and Ecballii Fructus—The latter is only used to prepare elaterium, from which the active principle elaterin is obtained, which is the most violent purgative known. Belonging to the hydragogue class, it produces profuse watery evacuations by its stimulating and irritating action on the liver and intestinal glands, by which it is eliminated.

Externally, it is a strong irritant when applied to a moist surface.

In the treatment of desperate conditions—like *apoplexy*, &c. —$\frac{1}{10}$ grain will draw off as much water and serum from the blood as a copious blood-letting. The $\frac{1}{20}$ grain is a good average dose, and, owing to the discharge of water produced by it, it is useful in *dropsies*, or in accumulation of fluid from any cause, especially where the kidneys are congested or fail to do their office, and the heart is not too weak. Its great use lies in its application to cases of formidable and *sudden anasarca*, threatening life by its rapidity, as in *œdema of the lung*.

5 grs. of the compound powder, put on the root of the tongue and washed down with a spoonful of water, should purge in a few hours.

Brunton states that it requires bile to be present for its purgative action, and that if injected under the skin it does not purge but produces *dyspnœa* and *tetanus*. The student should note the dose of elaterin—$\frac{1}{20}$ grain—while elaterium may be given in 10 times this quantity. The writer has found elaterium to fail completely in almost poisonous doses with one patient, when a smaller dose of the same sample half killed another more robust patient.

Elemi is a mild stimulant when applied externally, causing feeble inflammatory action in the skin. The ointment may be used as a dressing for *indolent* and *sluggish ulcers*.

Emplastra—The plasters of the Pharmacopœia are chiefly used for their physical qualities of adhesiveness. By strapping so that a hold can be obtained on the surrounding elastic tissues, considerable pressure can be constantly kept up, and in this way *inflammatory products* may be absorbed, especially if of *syphilitic* origin, the ammoniacum and mercury, or the mercury plaster, answering this end well. *Pain* may be relieved by the belladonna or opium plasters, while feeble counter-irritation and active rubefaction may be produced by calefaciens and cantharides. Adhesive plaster is the name given to the resin preparation.

With the exception of cantharides, all the plasters promote the absorption of superficial inflammatory deposits by protecting the part from variations of temperature. By checking evaporation the local temperature is increased, and the superficial part partakes somewhat of the benefits of an internal position, and glandular and lymphatic action become altered in some way, as is seen in the resolution of *chronically inflamed glands* and *joints*.

Enemata. (See under Aqua, page 329.)

Ergota, owing to the complex nature of the various active principles contained in ergot and the great difficulties in isolating them, experiments conducted with them have lead to confusing and contradictory results. The introduction of ergotine into the new B. P. will be a decided advantage. It has been noticed that where ergot has been taken for any time in the rye-bread used by peasants, *gangrene* and *paralytic symptoms* have supervened, though these are rarely seen after the prolonged medicinal use of the drug. Large doses of ergot cause vomiting and purging, paralysis of the sensory nerves, inco-ordination, and death through paralysis of the respiratory centre.

In moderately large doses ergot causes contraction of the involuntary muscular fibre throughout the body, the coats of arteries and veins diminish rapidly in calibre, and the vessels of the spinal cord are more especially contracted; there is a fall in arterial pressure, soon followed by a marked rise, but this rise does not occur in poisonous doses. The heart is little affected by moderate doses, though the pulse falls a little, but the uterus is powerfully influenced, and the arterial tension being raised in the glomeruli of the kidney, ergot acts as a diuretic, and at the same time assists the contraction of a weakened bladder.

Ergot is invaluable in *internal hæmorrhages*, 20 minims of the liquid extract every three hours relieving *hæmoptysis* by constringing the small vessels. In *urgent* cases the same amount may be injected under the skin every fifteen or thirty minutes. It is useful in all *hæmorrhages*, and sometimes, by acting upon the muscular walls of the intestines, it stops *diarrhœa*. The hypodermic injection of ergotine has proved effectual in curing *aneurisms* when injected into the tissue surrounding the sac, and in the same way it diminishes *fibroid tumours* of the uterus, and it has been recommended in *purpura* and excessive *sweating*, in *dysentery*, *enlargement of the spleen*, and *congestion of the spinal cord*.

It is, however, in *obstetric practice* that the virtues of ergot are appreciated. By acting on the uterine fibres it produces powerful tetanic contraction, and assists to expel the contents of the organ. Half-dram doses of the bruised fungus, infused for ten minutes in boiling water and swallowed without straining, will often arouse the slumbering energies of the uterus within five or ten minutes, but its administration requires discrimination: thus, it should not be given if there be any impediment to the descent of the head, or if the pains are already good; and sometimes it exerts its toxic effects

upon the child by the pressure of its tonic action on the uterus.

It is apt to cause irregular action of the muscular tissue, and often is the cause of retained placenta. It seems to act proportionately to the size of the uterus. In the early months of pregnancy it feebly affects the organ, but its power over it increases with every month of gestation. It is the best remedy we have for the relaxed condition causing *post-partem* hæmorrhage, where it may be given in dram doses, or 10 minims of the hypodermic injection may be injected *deeply* into a muscle or into the uterine walls in desperate cases. *Subcutaneous* injection is more likely to be followed by irritation and abscesses. The obstetric practitioner may find the infusion prepared upon the spot more troublesome, but he will have much more uniform and satisfactory results from it than if he employed the fluid extract. Where the medical man resides a long way from his patient, it is a good rule to never leave a recently-delivered case without previously giving a dose of ergot. Good results follow its use in *sub-involution* and *menorrhagia*, and various forms of *uterine fibroid tumours*.

In *prolapse of the rectum* the injection of ergotine, about 3 grs., into the sphincter or prolapsed bowel, every two or three days, as practised by Vidal, is followed by splendid results, and seldom fails to produce a lasting cure.

Eserine.—(See under Physostigma.)

Ether. (See under Æther.)

Eucalyptus Oil is a powerful antiseptic, destroying minute organisms. In some respects its action resembles quinine, thus it arrests the movements of the white corpuscles and causes the spleen to contract. In large doses it paralyses the brain and cord, causing death generally by its action upon the respiratory centre. Externally it is a rubefacient, and if covered with oiled silk it will blister. It is given in feverish septic conditions where quinine is indicated, and good results have followed its use in *puerperal fevers*, *pyæmia*, and *septicæmia* in 5 minim doses. It reduces the temperature, and has proved curative in *ague* and during its elimination by the bronchial mucous surface and the renal tract it is invaluable as a disinfecting expectorant in *phthisis* and *bronchitis*, and in *cystitis* and *gonorrhœa*. Kesteven, who has employed the oil in 220 cases of *typhoid* fever, in 10 minim doses, only lost 4. He found it produce a steady reduction of the force and frequency of the pulse, a steady fall of the temperature, with great improvement in the dry tongue and burning skin. He gave the following:—

℞. Olei Eucalypti m. lxxx.
Spt. Chloroformi
Spt. Ammoniae Arom.
Glycerini ana ℥iv.
Mucilaginis ℥iss.
Aquae ad ℥viii. misce.
Ft. mist. cpt. ℥i. quartis horis.

Locally the vapour has been used as an inhalation in *gangrene of the lung, phthisis, ozæna, diphtheria*, and a dilute solution is employed to wash out cavities and *irrigate foul wounds*. Made into a pessary it has been used in *cancer of the uterus and rectum*, and as a gauze it is used as an antiseptic surgical dressing.

Farina Tritici—Wheaten flour, in the form of bread, is too well known as a valuable food to require mention. It is used in medicine as an external application in *erysipelas*, where it acts as a simple protective by excluding the air and keeping up an even temperature. With water it forms an emollient poultice. A tablespoonful of flour swallowed in a tumblerful of cold water, morning and evening, is stated on very good authority to check the growth of boils.

Fel Bovinum Purificatum is employed in medicine where there is reason to suspect that the natural secretion of bile is deficient; the bile is known to assist the emulsification of fats, to act as an antiseptic and purgative, and to facilitate the absorptive powers of the mucous membrane. It may be given in 30 gr. doses as a bolus, or wrapped in wafer-paper.

Ferrum—Iron must to some extent be considered as a food, but if given in medicinal doses it cannot be so regarded. In health it has no power to increase the number of the red corpuscles, as recent experiments prove, but appears to act directly as an ozonising agent in large doses. It increases the appetite somewhat, and if the astringent preparations be administered constipation results: in any case the stools are black, and sometimes the bladder is irritated. None of these effects throw any light upon the action of the drug in disease, which is, beyond all doubt, a most valuable tonic to the whole system. It directly affects the blood in *anæmia*, increasing the red corpuscles, and thus enriching nearly all the tissues

with an increased supply of oxygen. The brain and nervous system benefit by this; their tone rapidly improves, and hence its great value in *exhaustive mental overwork*, and *neuralgia*, where iron is a tonic in the true sense of the word. In recovery from *fevers*, especially in cases where there has been *much brain activity* or *prolonged delirium*, the use of iron is often attended with the most marvellous results.

It is uncertain whether the iron acts by simply combining with the hæmoglobin of the blood, or, as some have supposed it, to act through stimulation of the lymphatic glandular system. The writer believes that iron produces its beneficial effects in the *liver* upon the blood during the changes which this fluid undergoes whilst being acted upon by the hepatic cells.

The soluble salts of iron are absorbed, probably in large amounts, and are, after passing through the liver, eliminated by the bile and by the intestinal secretion, passing out by the fæces in almost as large amount as when swallowed.

The action of iron is too often regarded as merely restorative, supplying to the blood a scanty constituent; but iron most probably acts by improving the assimilative powers, in the liver. The best results follow the administration of large doses of the tincture. It would occupy much space to mention the ailments for which iron is so highly praised, but many will be included by saying that in *anæmia*, from whatever cause, this drug may be freely given. It seems to possess specific power over *erysipelatous inflammations* when taken in large doses, and in *chlorosis* and *scrofula* its effects are nearly as evident.

Externally, the perchloride is a powerful astringent, and the strong solution acts upon the blood-vessels, and hardens the tissues. It is a valuable last resource when injected into the uterus in *post-partum* hæmorrhage, if reduced to about the strength of the diluted solution of the Pharmacopœia.

The scale preparations are favourites, especially the citrate with quinine, which, however, cannot be ordered with alkaline carbonates.

℞. Ferri et Quininae Cit. ʒij.
Spiritus Chloroformi ʒiv.
Inf. Calumbae ad ʒx. misce.
Fiat mist. ot. cochleare i. mag. ter in die.

The citrate may be given in effervescence, and makes a most elegant and palatable chalybeate mixture.

℞. Ferri Ammon. Cit. ʒij.
Acidi Citrici ʒiiss.
Aquam Destil. ad ʒvj. misce.
Fiat mist. st. cach. i. mag. ter in die cum cach. ii. mag. misc. alkalin. dum effervescent.

(Alkaline Mixture for the above.)

℞. Potassii Bicarb. ʒv.
Spt. Chloraf. ʒij.
Aquam ad ʒxij. misce.
Signa, "Alkaline Mixture."

The tartarated iron may be ordered with an alkali.

℞. Ferri Tartarati ʒj.
Syrupi Aurant. Flor. ʒj.
Potassii Bicarb. ʒiss.
Infus. Calumbae ad ʒx. misce.
Fiat mist. capt. cochlearia duo ampla ter in die.

Iodide of iron will be found invaluable in *struma* and *syphilis*, and in the form of the syrup is well suited to the taste of children.

(For a child two years old.)

℞. Syrupi Ferri Iod. ʒiij.
Olei Limonis gt. iv.
Syrupi ad ʒiv. misce.
Fiat mist. capt. cach. i. min. ter in die.

The pill of iodide of iron, as ordered in the Pharmacopœia, is objectionable on account of its instability. Blanchard's pill, about the same strength, is decidedly superior.

Tinct. Ferri Perchlor. is, perhaps, the best and most used preparation of iron. It cannot be given with alkalies or their carbonates.

℞. Tr. Ferri Perchlor. ℥j.
Glycerin. ℥j.
Aquae Destillatae ℥ij. misce.

Fiat mist. sf. ℥i. ex ℥j. aquae ter in die post cibos.

Glycerine is the best corrective to order with the liquid iron preparations, and makes a much more agreeable mixture than if spirit of chloroform is used, though the latter prevents the iron from causing any gastric irritation, and is sometimes retained when the stomach rejects more elegant combinations.

℞. Liq. Ferri Perchlor. ℥j.
Potassii Chlor. ℥ss.
Spt. Chlorof. ℥iij.
Aquae Destillatae ℥viiiss. misce.

Fiat mist. sf. ℥ss. ter in die post cib. ex aqua.

℞. Tr. Ferri Perchlor. ℥j.
Tr. Calumbae ℥ij.
Glycerin. ℥j.
Aquae ℥ij. misce.

Capt. coch. ii. min. ex coch. i. mag. aquae quater in die post cibos.

The *dialysed iron solution* is the least irritating and objectionable of all the iron preparations, and its hæmatinic qualities are unmistakable. It may be also used as an antidote to arsenic.

The syrup of phosphate of iron is useful in the dyspepsia of anæmic patients. It should be ordered by itself.

℞. Syr. Ferri Phosph. ℥iv.

Capiat ℥i. ex paululo aquae ter in die post cibos.

The *Mistura Ferri Co.* has long maintained its supremacy amongst the iron preparations as a remedy for *absent or scanty menstrual discharge*. If its position is well deserved, it is certainly by producing the maximum of good with the minimum of iron, as it is often in a decomposed condition before being swallowed by the patient.

The *Mist. Ferri Aromat.* is seldom ordered. Though an inelegant, it is a valuable chalybeate.

The *Saccharated Carbonate* is a very agreeable form of giving iron; and Neligan gives the following as a mild astringent in *infantile diarrhœa:*

℞. Ferri Carb. Sacch. gr. xxx.
Pulv. Myrrhae gr. xxiv.
Pulv. Cinnam. Co. gr. xxx. misce.

Divide in partes aequales xii., quarum sumatur una ter in die.

The *Sulphate* is a good tonic and astringent, and is a valuable addition to purgatives, and as Blaud's pills (*vide* page 53) is now one of the most frequently ordered of all remedies for *amenorrhœa*. In this form it does not cause constipation; 9 pills may be given in the day.

If a plain chalybeate is required without astringency, in the Ferrum Redactum such will be found.

℞. Ferri Redacti gr. lxxx.
Mannae q.s. ut fiat pil. xx.
℥t. i. ter in die post cibos.

Ficus.—The fig is nutritious, and acts as a mild laxative. When taken in large quantities it causes griping, probably by the presence of the indigestible fruits, or so-called seeds, irritating the mucous membrane, and setting up irregular and painful contraction. Split open and heated, figs make a popular emollient poultice.

Filix Mas is used as a remedy for *tænia solium* and *bothriocephalus*. It should be given to an adult in 30 to 60 minim doses, early in the morning, after a previous castor-oil purge administered at bed-time, to insure the complete emptiness of the bowels; or it may be given at night, after fasting, and be followed with a purge next morning. Care should be taken to look for the head of the worm, for until this is obtained there is doubt of its destruction. The fern seems to act as a direct poison to the parasite. It may be combined with turpentine.

℞. Ext. Filicis Liq. m. xxxv.
Spt. Terebinth. m. xxxv.
Ovi Vitelli i. misce et adde
Aquae et Syrupi q.s. ad ℥ij.
Fiat haustus, mane sumendus.

Recently Maj has tried this drug in *cholera* with what appears to be decided success; he gives it in doses of about 15 minims, with a few drops of laudanum and mucilage.

Fœniculi Fructus.—Fennel acts like Anethum (which see). In addition to its aromatic qualities, it is supposed to have the power of increasing the flow of milk. The water is a favourite antispasmodic for infantile colic, in teaspoonful doses for a child 1 year old.

Galbanum resembles asafœtida in its action, only it is feebler. It is a stimulating expectorant. Externally, the plaster is a mild stimulant to indolent *glandular enlargements*.

Galla.—Since the value of galls depends upon the tannic and gallic acid contained in them, the reader is referred to Acid. Gallicum.

Gelsemium.—Ringer and Murrell experimenting with a tincture (1 to 4) found the following symptoms after dram doses:—Pain in the brows, giddiness, and pain in the eyeballs and dimness of sight, double vision, ptosis, weakness of the

legs, sleepiness, and little if any effect on the pulse, and none on the mental faculties or temperature, the pupils contract, while a local application to the eye dilates them, but the pupils are found dilated after poisonous doses, and Ringer has proved this to be caused by the asphyxia, for gelsemium is a powerful respiratory poison.

It paralyses the sensory columns of the cord, and after at first stimulating the *motor* centres of the brain and cord, it paralyses them also—death occurs from paralysis of the respiration.

In poisonous doses the patient becomes unable to articulate or walk, tremor of the head is noticed, sensibility is impaired, the pulse becomes quick and finally cannot be felt, the respiration is slow, the temperature falls, and convulsions precede death.

Gelsemium has been found to possess decided power over *migraine* and *neuralgia*, and has relieved even when the cause was not removed, as in caries of the teeth and alveoli. The writer has found benefit from it in severe *tic*. It often appears to exert most power over neuralgia of the branches of the 5th nerve supplying the lower jaw.

Bartholow uses it in *pleuritis* and *pneumonia* (where it appears to relieve as aconite does), and in *asthma*, *laryngitis*, and *spasmodic coughs* of various kinds; but to be really beneficial in these cases it must be given in doses approaching the dangerous. It has been given with great advantage in the *hæmoptysis* of *phthisis*, and to cause dilatation of the rigid os.

Gentianæ Radix is a simple bitter tonic. Its mode of acting on the system is the same as that of Calumba (which see). It has been supposed to exert some slight stimulating effect upon the liver. Few remedies will give such good results in the *vomiting of pregnancy* as the infusion, combined with a mineral acid; it will often stop retching when all other remedies fail, and it is a feeble laxative.

℞. Inf. Gentianae Co. ℥viiss.
Acid. Hydrochlor. Dil. ℥iv.
misce.

Fiat mist. cpt. cochleare i. mag. ter in die ex paulula aquae.

Glycerinum—on account of its solvent and undrying properties—is used extensively in Pharmacy. The hypodermic administration of glycerine to dogs has been followed by tetanic convulsions, lethargy, dryness of the mucous membrane, fall of temperature, and death. No such symptoms have ever been noticed after being swallowed by man. Internally, it is nutrient, and has been substituted for cod-liver oil; but there is no proof that it possesses any of the valuable properties of this drug. Its administration is followed (if persisted in for a time) by increase of body weight; in large doses it causes red colouration of the urine, from transudation of the colouring matter of the blood. The experiments of Lewin prove that it produces *no* effect on the elimination of urea. It acts in some manner (in passing down the canal or in its elimination) upon *painful* and *inflamed piles*, and soothes them. It may be used to sweeten the unsavoury food of *diabetics*; and in large doses it is laxative.

Externally, it is emollient when applied to the skin, but occasionally, when undiluted, it acts as an irritant. It has been recommended in every form of *skin disease requiring emollient treatment*. By keeping the part to which it is applied continually soft it cures *fissures* and prevents *excoriations;* with borax it forms the most satisfactory application to *chapped nipples* and *stomatitis*, and can be used in the *aphthous* state so common about the *genitals* of badly cared for female children. It prevents *bed sores*. Applied on cotton-wool to the *os uteri*, and kept in contact, it causes a copious watery discharge, diminishing rapidly any congestion which may be present. Plugs inserted into the nostrils in a similar way may benefit *hay fever*.

Applied to the mouth and throat it relieves the distressing dryness of these parts in prolonged *feverish* states, and it relieves *reflex cough* and irritability of the fauces. It may be given for *hæmorrhoids*, in teaspoonful doses, to which a little chiretta is added to destroy its intense sweetness. Glycerine is a powerful antiseptic, a ten per cent. solution in water preserving animal substances from decay. It is useful in *dyspepsia*, especially in the fermentative variety, and in simple *anorexia* it often stimulates the appetite better than the ordinary tonic remedies. It is a good solvent for Salicylic Acid, many alkaloids, and neutral salts. Squire recommends a solution of 15 grs. isinglass in 1 oz. glycerine for various skin diseases.

Trastor has found that the *vapour* of glycerine produced by evaporating a few ounces in a porcelain capsule over a spirit

lamp gives great relief to harassing coughs in *phthisis* and other ailments.

Glycerines—For the action of the different official Glycerines see under the head of the drug bearing the name.

Glycyrrhiza has demulcent properties, and is used to relieve *cough* and promote *expectoration*. Any effect it has in this way is probably owing to reflex action. It is chiefly used for its pleasantly sweet taste. Fresh liquorice root is slightly laxative. The fluid extract covers the unpleasant taste of many nauseous drugs, and the compound powder is only of value on account of the senna it contains.

Gossypium—Cotton Wool—is employed for its physical qualities—softness, elasticity, &c. It affords a protective covering for *burned* and *blistered* surfaces, and is used as a padding for splints, and in *rheumatic fever* as a covering for the inflamed joints. The writer has found it to act most beneficially in *phlegmasia dolens*, applied in a *thick* layer over the entire limb, and most completely surrounded with Mackintosh, or oiled silk, and bandaged carefully so that the natural moisture cannot evaporate.

Granati Radicis Cortex—Pomegranate Root Bark—is a valuable astringent in the *dysentery* and *diarrhœa* of hot temperatures. In larger doses, it kills the *tape worm*, and 4 oz. of the decoction, repeated every two hours for four doses, and followed by a brisk purge if necessary, will prove a good remedy for this troublesome parasite. The drug itself acts in large doses as a cathartic.

The results (just published in the *Therapeutic Gazette* for July) of two marine hospitals where many anthelmintics were tried over a period of 23 years, prove that pomegranate root bark is the most efficacious of all remedies for the tape worm; 1 pint of the B. P. decoction was divided into 3 parts, one of which was taken every hour fasting. The bark owes its virtues to two alkaloids, and splendid results have followed the administration of these active principles known as Pelletierines.

Guaiacum once held a high position as a remedy for *syphilis*. It is now believed to have little or no action in this disease, and it is not much used. The only effect certainly known to follow its administration is that of a mild diaphoretic and emmenagogue. It seems to have some power in relieving the wearying pains of *chronic rheumatism*, and it was an important constituent in the famous "Chelsea Pensioner"—an electuary consisting of the following—and found useful in the rheumatic and gouty complaints of *old people*:—

(Chelsea Pensioner.)

℞. Guaiaci Resinae ℥j.
Sulphuris Sublimati ℥ij.
Pulveris Rhei ℥ss.
Pulveris Sinapis ℥ij.
Potassii Nitratis ℥ss.
Mellis vel Theriacae q.s. misce.

Fiat electuarium, ♎t. ℥i. mane nocteque.

The ammoniated tincture of guaiacum has been strongly recommended in *acute tonsillitis* in half dram doses in sherry. It will, however, often be found to aggravate. The mixture and powdered resin are better preparations.

Gutta-Percha is only used for its physical qualities; a solution in chloroform making a protective covering, like collodion, for *excoriations*, and it is employed to prevent *pitting in small-pox*. Coloured with a little chalk or calamine, this solution is useful when painted over the sutured line, instead of plaster, after *post-mortem* examinations. When neatly applied, the line of incision is hardly noticeable. Under the name of "Traumatieine" the solution has been praised by Auspitz, who uses it in many *skin affections* as a protective covering. It affords a good method for the local application of chrysarobin in *psoriasis*.

Hæmatoxyli Lignum—Logwood is a valuable astringent and tonic, acting like tannin. The extract, which is a hard solid, when dissolved in water will be found the most certain and reliable astringent in the *diarrhœa of tubercular ulceration* and the inveterate *diarrhœas of childhood*.

℞. Ext. Haematoxyli ℥iij.
Tincturae Opii m. lxxx.
Misturae Cretae ad ℥iv. misce.

Fiat mist. cpt. cach. ii. min. post singulas dejectiones liquidas.

Hemidesmus is supposed to act like sarsaparilla. It is a feeble stimulating diaphoretic, and is used as a remedy for *syphilis* in India. Possibly the fresh plant has some power, for the dried herb seems to have none. The syrup is used as a flavouring ingredient in cough mixtures.

Hirudo—Leeches are used to extract blood in local inflammations, and good healthy specimens may be calculated to remove two drams each. It is a good plan to apply them when possible over such prominences as will permit of a gentle pressure being applied in case of excessive hæmorrhage from their bites. In applying leeches they should never be touched by the fingers of the nurse or attendant. The physician should order the dispenser to send them in a perfectly clean chip box, which should only be opened as the affected part is exposed; and the inversion of the box (which should be steadily pressed against the skin till they fasten) is all that is generally necessary. The part should be very clean, and free from all traces of soap, mustard, &c. If the leeches refuse to bite, which is seldom, a little sugar or cream, or better still, the minute scratch of a needle, determines the point. If leeches are to be applied over a large surface, several boxes may be used; a 2 oz. box holds one dozen. They should not be pulled off after their feast, but should be allowed to drop. If, however, it is necessary at any time to remove them before their meal is completed, a little salt sprinkled over their backs acts as a brisk emetic, and they drop off at once.

Should further bleeding from the bites be required, a hot poultice or fomentation may be applied, or a cupping-glass may be put over the bites; this is an excellent plan. A pad of wool or gentle pressure with the fingers will easily restrain the hæmorrhage; but occasionally perchloride of iron must be used, or even a hare-lip needle, with a figure of 8 thread, may be required. Matico leaf will, however, answer all purposes when applied with moderate pressure.

The extraction of blood by leeches should not be recommended in severe or extensive inflammations, for if the system is to be affected it can only be by opening a large aperture and *rapidly* removing a fair quantity of blood in a short time. Space prevents a consideration of the arguments for and against the practice of blood-letting, but the writer has no doubt that by the *absolute* rejection of venesection, therapeutics loses a valuable remedy. He has twice seen life apparently flow in as the blood ebbed out. It is in cases of *engorgement of the pulmonary vessels*, following severe chest injury, and threatening imminent suffocation, that by boldly striking into a large vein life will be saved. The writer has followed this

course in a hopeless case of *submersion*, where death was apparently rapidly approaching. The systemic veins and pulmonary circulation were engorged, and the burdened right ventricle threatened momentarily to cease its almost ineffectual contractions. By making a *free* incision into the median basilic the inspiration became gradually slower, and the heart, eased by the relief of the systemic circulation, commenced to beat strongly, the patient appeared to be suddenly snatched from death, and made a speedy recovery. In such a case death would probably have occurred from suffocation, even had the patient's body been covered with leeches.

Hordeum Decorticatum—Pearl barley is a nutritious food. It is used for the preparation of the decoction, which makes an agreeable demulcent drink in *febrile conditions*, and serves to dilute cow's milk for bottle-fed children.

Hydrargyrum.—Mercury, when given in large doses in the metallic state, acts as a purgative by mechanically driving all matters before it, owing to its weight; but if any should remain in the saeculations of the intestine for a sufficient time till the juices of the bowel would render it soluble, the constitutional effects of the metal would soon show themselves.

Inhaled as a vapour, the metallic mercury is active; swallowed in a minutely divided state, or rubbed into the skin, or injected hypodermically, mercury and its salts produce marked constitutional effects. If only a minute quantity be administered, and for a short time, there will be an increase in the number of the red blood corpuscles, a general improvement in the circulating fluid, and an increase of body weight. (These effects are evident when very *small* quantities are given to domestic animals). If the minute doses be indulged in for a longer period, or if the quantity is increased, the blood loses in fibrin and red corpuscles, and becomes charged with excess of waste products; a brassy taste is felt in the mouth; the gums swell, and are marked with a blue line; the teeth are tender; the salivary secretion is increased; and fetor of the breath is noticed. The spongy gums soon ulcerate; the salivary glands enlarge; and as the metal is eliminated, it stimulates all the glandular apparatus — cutaneous, salivary, intestinal, and renal—by which it is thrown out; nervous tremors and disorders of co-ordination appear; emaciation, prostration, and finally death will occur. These symptoms are much the same after the administration of any mercurial preparation in small doses.

The *inhalation* of mercurial fumes, as seen amongst mirror-makers and others, often produces symptoms confined to the

nervous system. This form of chronic mercurialism is known as "Mercurial Palsy." There is tremor of the muscles of the extremities and head, at first sight not unlike *paralysis agitans*.

Calomel, mercurial chalk, or blue pill are the preparations administered when we wish to get the physiological effects of mercury; the red iodide and corrosive sublimate being violent irritants, causing death like irritant poisons. The salts of mercury are dissolved in the stomach or intestines, and find their way into the blood as albuminates, and in their passage out exhibit their remarkable selective action, chiefly on the salivary glands, and it is supposed also on the pancreas.

Exaggerated ideas of the dangerous results of mercury upon the system have arisen, probably because in disease the use of the drug has been generally pushed too far. We know now that it is entirely unnecessary to produce the above effects in order to treat a disease by mercury, and it is evident to those who closely watch the effects of mercury upon children that they will improve and grow fat upon it even for a long time, if judiciously administered.

Internally, mercury has been generally given (1) to control acute inflammation, or (2) to cause the absorption of inflammatory products, or (3) to combat the poison of syphilis.

There are, moreover, various groups of symptoms for the dispersion of which mercurials are used. The *diarrhœa* and obstinate *vomiting of children* often yield to minute doses—$\frac{1}{10}$ gr. of calomel every hour. A group of symptoms, known popularly as *biliousness* in the adult, is frequently dispersed by a good dose of calomel or blue pill, which, by removing all sources of irritation in the intestines, relieves an over-loaded liver, or remedies a catarrhal condition of the bile ducts.

Much dispute has arisen out of the action of calomel upon the liver, and recent experiments prove, what had been surmised, that calomel acts as a purgative—not by stimulating the liver to secrete more bile—but by irritating the duodenum, so that the bile is swept down the canal before time is allowed for its absorption. There is thus really less bile circulating with the blood after a dose of calomel (which causes free purgation) than there was before. Few now advocate the use of mercury in *acute inflammations*, excepting in the case of *iritis*, and it is seldom employed to cause the absorption of effused products, though it is strongly maintained by a few that it controls *meningitis*, and assists the absorption of fluid effused within the cranium. In *meningeal inflammations* of a tubercular nature, after effusion has occurred, if the system be *rapidly* brought under the influence of mercury, such improvement often immediately follows as to lead one to believe that

a partial absorption of fluid had resulted. It is hardly necessary to say that it has no effect whatever in arresting the disease, and the symptoms again increase in severity. But in *simple meningitis* the writer has been fortunate enough to witness such unmistakable results as satisfied him of the power of mercury in assisting the absorption of effused inflammatory products inside the cranium.

In *typhoid fever*, large doses early in the disease are believed by many Continental physicians to curtail its course.

Mercury in Syphilis—Even here the virtue of mercury is doubted, but the authority of Hutchinson is decidedly in its favour, as is that of most observers, and it is probable "that mercury is a true vital antidote to the syphilitic poison, and is capable of bringing about a real cure." The same high authority just mentioned believes that many cases of indurated *chancre* treated early by mercury never show any of the characteristic symptoms of the secondary stage, and when these do appear they are milder than in cases where the mercury had not been used.

Mercury has, however, not only no action on the soft spreading sore, but its administration is injurious. In true indurated chancres, the mercurial should be commenced as soon as possible and continued till thickening and induration melt away. Ptyalism and the other constitutional effects of the drug should never be produced, but small doses of the non-irritant preparations—calomel, as in Plummer's pill, or grey powder—should be steadily administered, and their use instantly suspended upon the appearance of changes in the gums or an increase of saliva being observed. One grain of calomel, with quarter this quantity of opium; or one grain of blue pill or grey powder morning and night; or $\frac{1}{12}$ grain of corrosive sublimate twice a day; or 5 grs. of Plummer's pill, three times daily, will be found enough.

After mercury fails to produce its effects when given by the mouth it may be introduced into the system by *inunction*, as advised by Sigmund; about half a dram of the ointment being rubbed into the skin night and morning; it often brings out a troublesome eczema. The *hypodermic* method is equally objectionable, a painful swelling, with suppuration, often following the puncture, while the plan of *fumigation* with a spirit-lamp and calomel is both troublesome and uncertain. On the first sign of the constitutional effect of mercury upon the system the dose should be diminished or suspended for a few days. Those who believe that mercury is useless in the later stages of syphilis have not, perhaps, administered the remedy for a sufficiently long period, since

sometimes the patient must continue to take it for two or three years before the poison is eradicated from the system.

Prof. Lewin has used the hypodermic injection of corrosive sublimate in 50,000 patients in Berlin, with better results than those given by any other treatment, abscesses were never produced, and pain was trifling.

In *congenital syphilis* there is no preparation equal to grey powder, which may be given freely, as mercury in moderate doses seems incapable of doing harm whilst there is a large amount of the syphilitic poison for it to expend itself upon. Weak, emaciated infants bear larger doses when poisoned with syphilis than they can when afterwards apparently cured and fattened; but if, after a period of neglect, syphilitic symptoms came on markedly, then they bear very large doses again. A child one year old may get ½ grain of grey powder three times a day for three days, then ½ grain every night, and this may be continued as long as the infant thrives. If no result seems to follow, a little of the ointment may be rubbed in occasionally.

It has been long known that grey powder may decompose, and that some of the mercury may be converted into the oxide, which upon being swallowed might be still further changed in the stomach into the irritating perchloride. Magnesia can be substituted for the chalk with advantage.

The *corrosive sublimate* is the most poisonous of the mercurial compounds, causing violent purging, collapse, and death in a few hours when taken in large doses. It is the most powerful destroyer of germ life, and has been used locally in a host of septic conditions with advantage. In *obstetric* practice, *diphtheria*, *gonorrhœa*, *diarrhœa*, and numerous other ailments its local application, with or without its internal administration as well, is beneficial. Considering, for example, the infinitesimal quantity of this substance necessary to form a solution which will hinder the growth of anthrax bacilli—viz., 1 in 1,000,000 (or 1 grain in 14 gallons water), it is easy to realise the enormous benefit which may be obtained from its disinfecting qualities without endangering the system by the action of the drug. Small doses are strongly recommended in *cholera*.

The following is a convenient form for administering mercury:—

℞. Hydrarg. cum Creta gr.iiss.
Pulv. Doveri gr.ij. misce.
Fiat pil. secundum artem, mitte tales xxiv. ♎. i. bis in die.

Or,

℞. Hydrarg. Perchloridi gr. ij.
Potassii Iodidi ʒij.
Aquae Destillatae ʒxij. misce.

Fiat mistura, ɑt. ʒss. ter in die post cibos.

Externally, *Ungt. Hydrarg.* is used to produce the constitutional effects of mercury upon the system, by being rubbed into the skin. The following are a few of the uses of the different mercurial ointments of the Pharmacopœia which are applied for their local action :—

Ungt. Hyd. Subchlor., diluted with half its weight of lard possesses the power of relieving the painful *itching* of various *eczematous* conditions about the genitals and anus ; it is a valuable application to *all* indolent *syphilitic skin diseases*, and rarely causes salivation.

Ungt. Hyd. Ammon. acts as a poison to vermin, and readily destroys pediculi and their ova, and is used to kill the parasites which cause *tinea*, &c.

Ungt. Hyd. Co. and Liniment. Hyd. are used as substitutes for Scott's dressing. Spread upon lint, and applied with pressure around diseased *joints and glandular enlargements*, they are useful by stimulating the lymphatics.

Ungt. Hyd. Iod. Rub. is an active rubefacient, seldom used in this country except in veterinary practice, but is a powerful remedy for *goitre* in India, when aided by the rays of the sun.

Ungt. Hyd. Nitratis Dil. is the best application in the scaly stage of *eczema*. It acts as a stimulant, and in some way alters the action in the diseased skin, often after every other remedy fails. It is invaluable in inveterate *ozæna*, when diluted with glycerine and brushed inside the nose.

Ungt. Hyd. Ox. Rub., diluted with eight times its weight of lard, or, preferably, an ointment of the yellow oxide (6 grs. to 1 oz.) is an invaluable stimulant and alterative in obstinate *conjunctivitis* and *eczema of the eyelids*, and is identical with "golden ointment."

The *Oleate of Mercury* is an unstable and unsatisfactory compound, and, prepared according to the official formula, can hardly be expected to give as good results as a weak ointment of mercury.

Lotio. Hyd. Nig. and Flav. are stimulating applications to various *chancroid* and other *sores* of a specific origin. Their efficacy in these troublesome complaints leads one to suppose that they act by destroying the syphilitic poison as they come in contact with it.

Liq. Hyd. Nitratis is a powerful caustic, especially indicated in the treatment of *syphilitic warty growths* and *scrofula derma*.

A solution of the perchloride (3 grs. to 1 oz.) is used to destroy the *parasite of various skin diseases*.

Hyoscyami Folia.—This drug affects the system like belladonna, producing delirium, dryness of the mouth, dilatation of the pupil, and sleep. It differs from it in being more decidedly hypnotic and less stimulating to the heart, and in possessing a sedative influence over the urinary mucous membrane as it is being eliminated by the kidneys. Dr. Harley has shown that small doses are sedative and tonic to the heart; large doses excite, while excessive doses depress it; hence its usefulness in *cardiac asthma* and excitement of the heart from valvular lesions. In all the *spasmodic* affections in which belladonna is useful, hyoscyamus may be employed. In inflamed and irritable conditions of the *bladder* it is the best remedy we possess. The active principle of the drug is a mild *diuretic*, and in passing out of the system, exerts its sedative influence upon the terminal nerves of the irritated membrane; and it is especially indicated when the bladder is contracting frequently to expel small quantities of urine unnecessarily. In these cases it may be advantageously combined with alkalies. It seems to increase the narcotic effects of opium, and its alkaloid hyoscyamine promises well in acute mania. (See under Hyoscyamine in the non-official remedies.

Children bear enormous doses of hyoscyamus, whilst the *aged* are seriously affected by even small quantities. It corrects the painful griping of purgatives, and relieves the pain of *internal neuralgic affections*. The juice in teaspoonful doses is the best preparation.

℞. Tr. Hyoscyami ℥vj.
Potassii Bicarb. ℥iv.
Spt. Chloroformi ℥iv.
Aquae (or Aquam) ad ℥viij. misce.
Fiat mist. et cach. i. mag. quater in die ex paul. decoct. hordei.

Iodoformum, in large doses, or where it has been absorbed from extensive wounded surfaces, produces disturbance of digestion, loss of appetite, rapidity of pulse, increase of temperature, and cerebral disturbance, not unlike some forms of alcoholic intoxication, passing into melancholia, collapse, and possibly death. These symptoms may come on suddenly without warning if the salt has been applied to a large surface, though M. Moorhof, who has exclusively used it for five years in hospital and private practice, has never seen one case of poisoning. He emphasises the fact that he used no other antiseptic with it, and to this he attributes his immunity.

Iodoform is freely excreted by the pulmonary surface and kidneys, appearing as iodine in the urine, and though containing 90 per cent. of nascent iodine, it does not produce the irritant symptoms of even small doses of that drug. It is for its *powerful* antiseptic properties that iodoform is used in surgery, dusted in fine powder over *sloughing sores, chancres, buboes, bed sores,* and *cancers,* it prevents decomposition and excites healing. The stench of cancerous discharges from the vagina and rectum is instantly removed by the use of a pledget of lint soaked in 1 dr. iodoform to 1 oz. glycerine. A solution of 1 in 12 of ether, or of 1 in 12 of flexible collodion, may be painted over *syphilitic sores.*

Iodoform is a powerful local *anæsthetic,* destroying sensation in the parts to which it is applied as carbolic acid does; the official suppository causes the sensation to be much blunted after its introduction into the rectum or vagina.

A bougie containing 10 per cent. of iodoform, with eucalyptus oil and cacao butter, has been extolled in *gonorrhœa,* but it will achieve nothing which permanganate of potassium will not more easily and permanently accomplish.

The official ointment is of sufficient strength for all ordinary sores, while 10 to 20 grs. to 1 oz. will be found strong enough for application in *ophthalmia;* 1 to 4 may be used for *granular lids.* Its anodyne and antiseptic properties render it a remedy of great value for *burns,* where the gauze soaked in glycerine and water and covered with cotton wool and oiled silk can be used with benefit. Marchand found that it prevents the formation of the giant cells in tubercle, and it certainly has wonderful power when applied to scrofulous and tuberculous abscesses and injected into lymphatic growths.

Iodoform ointment has been proved by Grigorieff to be a splendid remedy for *scabies,* and free from the objections of all other remedies.

It has been recommended as an inhalation in *phthisis;* but the internal administration in ½ to 3 gr. pills in the writer's

hands has given most satisfactory results, diminishing expectoration, checking hectic, and allaying cough in a way which no other drug appears to do. It seems to exert its healing antiseptic, and sedative properties upon the mucous membrane of the bronchi, and the lining of the air cells during its excretion by this tract. In a similar way it may be expected to prove useful in *cystitis* and *urethritis*. Recently Testa finding that the drug increased arterial tension and acted as a diuretic, has used it in *valvular disease*. It is of no value as an anthelmintic as has been stated by Sim, but success has followed its use in some cases of *diabetes*. It has been given in *ulcer of the stomach* for its local action. Tonquin bean, musk, and Peruvian balsam cover its nauseous odour.

Iodum externally is a valuable counter-irritant, weak solutions causing mild rubefaction, while strong preparations, like the liniment, will cause vesication, and even leave an unsightly scar. There can be little doubt that very weak solutions (half the strength of the tincture) are absorbed when applied to the skin, and finding their way into the tissues stimulate the absorbent vessels, and thus aid the removal of *glandular swellings* and *local effusions*. The liniment applied in its strength, is found to cause changes of position in the corpuscular elements under the skin, but any effect produced by it is not owing to its absorption, but to its counter irritant qualities. It has been found useful in chronic *glandular enlargements*, in various painful affections of the *thoracic* nerves and muscles, and painted in the neighbourhood of small *local inflammations* it often arrests the suppurative process. It is a powerful antiseptic, and the liniment will destroy the parasitic skin diseases.

One part of the tincture in fifty of water is used to wash out *cysts* in which putrefactive changes are going on; and diluted with an equal bulk of water, or alone, the tincture is injected into the serous cavity surrounding the testicle in order to excite adhesive inflammation and work a radical cure in *hydrocele*.

The vapour of iodine is used for inhalation in chronic suppurative *bronchial* affections. The tincture injected into *solid bronchoceles*, enlarged *lymphatics*, and various *glandular growths* (15 minims) cause their absorption.

Iodine is a powerful irritant poison, soon producing violent vomiting, purging, giddiness, convulsions, syncope, collapse, and death.

Internally, iodine in the free state is not often used, most authorities believing that iodide of potassium possesses all the properties of the metalloid, without the disadvantage of it

causing gastric irritation. It is much inferior to iodine in the treatment of *scrofula*, and it produces results in *malaria* where iodide of potassium is inert.

Since *Iodide of Potassium* is the form in which iodine is generally prescribed internally, its use will here be referred to. It is an antiseptic of great power. Given to a healthy man, iodide of potassium, in small doses (½ gr.), improves the appetite and increases the weight of the body. It is rapidly absorbed, and probably remains as iodide of sodium in the blood; and if the dose is increased, and taken frequently, a characteristic group of symptoms is developed, to which the name of *iodism* is given. A brassy taste is felt in the mouth, the amount of saliva is increased, and there soon appear signs of irritation of the mucous membrane of the eye, nose, throat, and bronchial passages, resembling an ordinary catarrh, with swelling of the eyelids; the brows and teeth ache; eruptions like acne, purpura or urticaria appear; appetite fails, nausea and diarrhœa come on; waste increases, causing emaciation, debility, and a sinking feeling at the bottom of the sternum; sexual power is destroyed, and the urine becomes increased in amount, and tuberculosis may supervene. All the glandular organs of the body seem to be stimulated to increased activity, and the drug has been said to cause wasting of the mamma and testicle. In some, the symptoms of iodism cannot be produced, as patients have been known to take one dram of the iodide of potassium daily for several months or years. It is eliminated by the kidneys, salivary glands, bronchial membrane, and mammary glands; and Binz believes that whilst being eliminated, and also whilst being carried to the different tissues of the body, *free* iodine is given off. It is this free iodine which produces all the effects of the drug. In this way the irritation of the eyes, nose, and bronchial membranes are produced, and the eruptions are probably produced by the elimination of the free iodine by the glands of the skin.

It is invaluable in many *scrofulous* states, causing the absorption of various *effused unhealthy products*, either by increasing the activity of the absorbents or by rendering such products more fluid. In this latter way it acts upon the secretion of *chronic bronchitis*, and thus becomes one of our best expectorants. The products of *pleuritis*, *pneumonia*, and *pericarditis* often yield to moderate doses (5 grs.), and it is the best remedy for the early stages of *cirrhosis of the liver* and *lungs*. Schmidt has used it with success internally, along with the local application of cold to *goitres*. It is a strong anaphrodisiac and antigalactagogue, diminishing the secretion of milk satisfactorily in 10 gr. doses.

In *chronic rheumatism*, *gonorrhœal rheumatism*, and *rheumatoid arthritis* it gives good results.

In large doses (20 grs. and upwards) iodide of potassium has been used for the treatment of *internal aneurisms* beyond the reach of surgery; and the writer has seen one case of aortic aneurism completely cured, under the care of Professor Cuming, by large doses of the iodide, the patient afterwards dying from tubercle of the lung; the sac was found perfectly solid. It probably acts upon the coats of the diseased bloodvessel, and may affect alterations in the physical qualities of the blood; it also leads to fibrinous deposition and solidification. It may give marked relief to the wearying pains caused by aneurisymal growths without exercising any cure.

Recently it has been used with apparent success in the treatment of *enteric* fever on the Continent; it has been alleged (presumably by its antiseptic virtues) to cut short the duration of the disease, lowering permanently the temperature and pulse, and relieving pain and diarrhœa.

In *chronic metallic poisoning*, the iodide of potassium, entering the blood, meets with the albuminates of mercury or lead stored in the tissues, and by forming soluble salts, which are eliminated, the system is purged of the poisons.

In a somewhat similar way iodide of potassium combines with the specific poison in *tertiary syphilis* and decomposes it. Its power over *nervous lesions*, the result of syphilitic deposit, is rapid, certain, and lasting; *gummata* melt before its influence, and *bony enlargements* of a specific origin are often speedily reduced; but it must in such cases be pushed boldly in doses of 20 to 40 grs. Some physicians push the drug in such cases to the extent of 1 oz. in 24 hours, and Seguin states he has given 2 drs. thrice daily to patients between 4 and 8 years old without any bad results; this line of treatment he speaks of as the "American." The physician will seldom meet with cases where such doses are ever necessary.

The same effect is occasionally noticed as was mentioned about mercury in congenital syphilis—*i.e.*, after the apparent destruction of the specific poison, the system is less tolerant of the drug. It appears to possess little influence over the earlier stages of syphilis. The pains of *rheumatoid arthritis* are often benefited by the judicious administration of the iodide, and it speedily relieves *bronchial asthma* depending upon simple catarrh. It acts occasionally as a powerful diuretic when other remedies fail, but it is uncertain, and must be given in very large doses.

The treatment of *hydrocephalus* by iodide of potassium has many advocates, and though it appears to have some control

over the amount of fluid poured out, still evidence is not forthcoming to prove that it has any curative influence.

Half a grain, with 10 minims of hippo wine, is a valuable tonic given after food. Ammonia increases the effect of iodide of potassium, and when the dose exceeds a few grains it should never be given to a fasting patient.

On page 53 will be found the description of a method by which 6 grs. of the iodide can be ordered in a pill.

℞. Potassii Iodidi ʒiv.
Tinct. Calumbae ʒj.
Spt. Ammon. Ar. ʒiv.
Aquae Destill. ad ʒvj. misce.

Fiat mist. cpt. cochl. ii. min. post cibos ex aqua ter in die.

Or,

℞. Linimenti Iodi ʒj.
Liquoris Potassae q.s.
Ad saturat. ferme, et. min. xx. ex cyath. aquae ter in die post cibos.

The following is the best form for external application :—

℞. Linimenti Iodi
Tincturae Iodi ana ʒj. misce.

Fiat applicat. mane nocteque utend.

Ipecacuanha was formerly employed as a counter-irritant, owing to its power of producing a pustular eruption. It has entirely given way to other more convenient and certain rubefacients. The active principle *(emetine)* is a powerful poison. Large doses of the powdered root cause vomiting—*directly*, by acting upon the peripheral extremities of the pneumogastric nerve supplying the membrane of the stomach; and

indirectly, by stimulating the medullary centre, which presides over the complex act of vomiting; this effect is produced either by the hypodermic injection of the alkaloid or by its internal administration. Its emetic action is too slow to be of use in poisoning, but it is highly beneficial in *croup* and *bronchitis* in children. In smaller doses ($\frac{1}{2}$ gr.) ipecacuanha acts as a direct stomachic, increasing the vascularity of the stomach, and promoting the flow of gastric juice, and, combined with the same quantity of iodide of potassium, we have one of the best remedies for *atonic dyspepsia*. Still smaller doses (1 min. of the wine), Ringer affirms, will cure the *vomiting* of various conditions, as *pregnancy*, *alcoholism*, *migraine*, &c. In larger doses (3 to 5 grs.), the powder acts as a diaphoretic, but is uncertain unless when combined with opium —as in Dover's powder—and it is remarkable that the combination is so efficacious, only a grain of either remedy being in each dose, while much larger quantities of each, separately, are so uncertain. In diaphoretic doses, it also acts very markedly upon the *bronchial* mucous membrane, causing free secretion of thin mucus; hence, in disease it is one of the best expectorants we possess. The increased tough secretion of *chronic bronchitis* is thus rendered more fluid, and comes up with greater ease to the patient; whilst in acute attacks the dry inflamed membrane is soon covered over with a moist secretion after the administration of full doses.

Rossbach demonstrated the expectorant powers of emetine upon the exposed tracheal membrane, as previously mentioned on page 327, and his results prove it to be almost as valuable as apomorphine in *bronchial catarrhs*, *croup*, and *laryngitis*. It is especially indicated in inflammatory affections of the bronchial membrane in children, assisting the expulsive action and diminishing markedly the adhesiveness of the secretion; its *diaphoretic* effect in these cases being also beneficial.

In *winter-cough* there is no remedy more efficacious than ipecacuanha, and a spray of equal parts of the wine and water has been most successful in Ringer's hands in various bronchial ailments.

The writer, in conjunction with Dr. Workman, made a series of experiments on the action of various remedies upon the cilia of the bronchial mucous membrane. Though a weak solution of ipecacuanha succeeded oftener and more effectually than any other remedy in restoring the movements after their cessation, the results were far from satisfactory or conclusive.

In speaking of ciliary excitants on page 322 the probability of medicinal substances assisting expectoration by their in-

fluence upon the cilia was referred to. Indeed, a study of the structure of the ciliated epithelial cell would show that it is hardly possible for the activity of the cell itself to be markedly increased without the cilia participating.

Ipecacuanha has been given in nauseating doses in various *hæmorrhages* with uncertain success. On the liver this remedy acts as a powerful stimulant, and it slightly increases the intestinal secretion.

In *dysentery*, in the acute stage, it possesses powers which are deemed almost specific; it should be given in doses of at least 20 to 60 grs., and the stomach seldom rejects it, if absolute rest be enjoined and liquids sparingly swallowed. In *acute pneumonia* doses equally large have been given with good results. The new official wine is a great improvement on the old, and will more than sustain its reputation as a favourite remedy in the *bronchial affections of infancy*. It has some influence over *whooping-cough;* as an emetic, the wine may be given in teaspoonful doses every 15 minutes to a child 1 year old, or 5 minims may be administered every hour in bronchitis.

(Fothergill's Dinner Pill.)

℞ Pulv. Ipecacuanhae gr.j.
Acid. Arsenios. gr.$\frac{1}{20}$.
Pil. Aloes et Myrrhae gr.iiss.
Pulv. Pip. Nig. gr.ij. misce.

Fiat pil. "The same dose of strychnine may be substituted for the arsenic." Above is an excellent fillip to the digestion.

Jaborandi, and Pilocarpine—its alkaloid—act as powerful Sialagogues and Diaphoretics. After the hypodermic injection of $\frac{1}{3}$ gr. of the nitrate of the alkaloid marked results follow in a few minutes. There is flushing of the face and neck, beads of perspiration appear on the skin of these parts and rapidly extend over the body, and soon the entire cutaneous surface becomes bathed in profuse perspiration, which may pour in streams for some hours from the patient, saturating his garments or soaking the bed clothes. Saliva at the same time commences to flow, and it becomes also very profuse. Other secretions are augmented—the tears, bronchial and nasal mucus, gastric and intestinal juices, the cerumen from the ears, the urine, and if a female the milk, and uterine and vaginal mucus are increased. The blood vessels dilate as seen

by the throbbing carotids, the pulse quickens, and the patient seems warm; soon, however, with the full establishment of the perspiration he feels cold and shivers, the pulse slows a little, while the blood pressure rises and finally falls. The pupils contract and the accommodation becomes tense, vomiting and painful forced micturition occur. As the effects pass off the pupils may dilate, and the patient feels sleepy and exhausted, and if put in the balance may be found to have lost half a stone in weight. The salivation and perspiration are the result of a stimulant action on the peripheral terminations of the nerves of the salivary and sweat glands, as well as some irritation of the *centres* which preside over these organs, the other secreting organs are probably affected in the same duplex manner. The contraction of the pupil is caused by the irritation of the peripheries of the third nerve, and follows also its local application. The spleen, uterus, bladder and intestinal muscular fibres contract, and in large doses the heart fails through paralysis of the endings of the vagus, which were at first stimulated, the ganglia escaping. The bile is not increased; the drug is eliminated by the kidneys, but not by the skin. The respiration is scarcely affected. The writer has sometimes seen collapse and alarming prostration speedily follow the hypodermic injection of even $\frac{1}{4}$ gr.

Nearly all the effects of pilocarpine are antagonised by atropine, and it fails to produce salivation and sweating if this latter drug has been previously administered. Atropine should be promptly injected if alarming symptoms shewed themselves during the use of Jaborandi or its alkaloid.

Pilocarpine has been locally applied to the eye in *glaucoma*, *intra-ocular hæmorrhage*, *iritis*, and *retinitis*, and good results appear to have followed its hypodermic administration in *detachment of the retina*. The marked effects of the drug on the skin and urine have led to its use in a numerous list of diseases. Thus in *uræmic coma* and *convulsions* the hypodermic use of $\frac{1}{4}$ gr. will sometimes save life by the rapid elimination of urea and other products, by the perspiration. In Bright's disease the hypodermic injection of the alkaloid, or 5 grs. of the extract, or 1 oz. of the infusion given by the mouth gives good results by diminishing blood and albumen and increasing the amount of urea. In the same way it diminishes *anasarca*, and by stimulating the kidneys assists in the removal of *pleural* and *peritoneal* accumulations. In *bronchial* affections it produces most marked effects, even blocking up the tubes by the profuse secretion which it creates, but it does not achieve anything which apomorphine and emetine will not perform without the serious drawback of its action

upon the skin and saliva (see page 328). Nevertheless it has been used in *asthma*, *pertussis*, *bronchitis*, *tonsillitis*, *laryngitis* and *diphtheria ;* in *diabetes*, *amenorrhœa*, *uterine* affections, *syphilis*, in poisoning by *atropine*, and in chronic poisoning by *iodine*, *arsenic*, *lead* and *mercury ;* and in skin diseases, as *prurigo* and *urticaria*. Under its use the hair has been noticed to grow rapidly, and it has been given to cure *baldness* with some success. Hypodermic injection will relieve ordinary *toothache*.

Small doses ($\frac{1}{25}$ gr.) are beneficial in the sweating of *phthisis* and large doses ($\frac{1}{3}$ gr.) cause contraction of the *uterus*, and may induce labour. *Hydrophobia* has been successfully treated in a few isolated cases by its use.

Jalapa is a powerful hydragogue cathartic, acting, like scammony, entirely by its *local* irritating effects upon the intestine, as injection of its active principle into the circulation has no effect upon the bowel. It must come in contact with the bile to be efficacious; the extract and resin produce considerable pain and griping; the compound powder will be found the most satisfactory form for giving the drug, and it is especially in *anasarca* and *ascites* that it is indicated. It may be given in dram doses, stirred up in a tumbler of water, or swallowed dry in wafer-paper. The resin possesses the great advantages over the root in being less bulky and less nauseous, and may be given in 4 gr. doses, in pill.

Juniperi Oleum.—A mild stimulant and stomachic in small doses. It rapidly enters the blood, and is picked out by the kidneys, which it powerfully stimulates, carrying with it increased quantities of water if *dropsy* exist, while in health it may even diminish the quantity of water. It excites the *genital organs*, and seems to resemble cantharides when given in very large doses, as strangury and priapism have been known to follow its use. The spirit makes a good addition to diuretic mixtures, and may be used as a substitute for gin, which it resembles.

Kamala is a cathartic, 2 drams speedily producing copious evacuations ; it is, however, only used for its destructive action upon the *tape* worm, killing it, and afterwards causing its expulsion. It will in a like way destroy *lumbricoids*. 1 to 2 drams should be taken suspended in mucilage or gruel, and, if necessary, a purgative should follow.

Kino is a powerful astringent, containing nearly $\frac{3}{4}$ of its weight of tannin; it acts like it, and is useful in *diarrhœas*, *hæmorrhages*, *relaxed throat*, or when the effect of tannin is desirable. The compound powder is an excellent preparation, combining with the astringency of kino the narcotic effects of

opium. It closely resembles in its action both catechu and krameria.

Kousso. (See Cusso.)

Krameria.—Rhatany is a valuable astringent and tonic, resembling kino and tannin in its action. 5 grs. of the extract and $\frac{1}{4}$ gr. morphine made into a suppository are valuable in *fissure* and *prolapse of the anus;* and a teaspoonful of the tincture in a wineglassful of water makes a valuable wash for *spongy gums, relaxed throat*, or *mercurial stomatitis;* or the following may be used:—

℞ Tinct. Krameriae
Tinct. Myrrhae
Tinct. Cinchonae
Tinct. Kino ana ℥j. misce.

Fiat mist. ℥i. ex ℥i. aquae utend. pro laf. oris mane nocteque.

Lac.—Milk is introduced into the Pharmacopœia for making scammony mixture, and in addition to its nutritive qualities it is especially indicated as a diet where it is desirable to diminish as much as possible the bulk of the fæces. Externally it is emollient, and may be used with much advantage as a soothing injection in inflamed conditions of the *vagina* and lower part of the *neck* of the *uterus*. It is a good vehicle in which to administer camphor and quinine.

It should be used to wash out the stomach in poisoning with corrosive sublimate and sulphate of copper.

Lactuca.—Lettuce has been introduced as a substitute for opium. It does produce feeble narcotic results, acting like this drug, but its effects are so uncertain that it could be well dismissed from the Pharmacopœia as unnecessary. It active principle—lactucarium—may be taken in 10 gr. doses, and possesses feeble diuretic powers.

Laricis Cortex.—Larch bark is a weak astringent containing tannin, and possesses some power in diminishing the profuse secretion of *chronic bronchitis*. On being eliminated by the bronchial mucous surface it is, like turpentine, very useful in *hæmorrhage* from this membrane. It is beneficial in the *hæmorrhage of purpura*.

Laurocerasi Folia, though often used as a mere flavouring ingredient, contain hydrocyanic acid, and possess, when taken in sufficient doses, all the powerful sedative properties of that drug. The "standardising" of the aqua in the new B.P. is a great improvement. It can now be used with the certainty that it always contains the same amount of acid. (See Acid. Hydrocyanic.)

Lavandulæ Oleum acts as an antispasmodic, like the following; it is seldom used except as a perfume, and the tincture is prized as a colouring ingredient, and enters into Fowler's solution, which undoubtedly would be better without it. Five minims of the oil on sugar will rapidly relieve *colic*, and it can be given in combination with cajuput.

Limonum.—The oil and rind of the lemon are used in medicine only on account of their flavour, though in 5 to 10 minim doses the oil is a valuable remedy in painful and *irregular contractions of the intestinal tube* caused by accumulations of gas produced by fermenting food.

A decoction prepared by boiling fresh unpeeled lemons, sliced, is regarded as a valuable antiperiodic possessing power over *malaria*. (See under Acid. Citric., p. 303, where the action of the Succus is described.)

Linum—Flaxseed contains a mucilaginous principle, which it yields to boiling water, and which acts as a soothing demulcent when it comes in contact with the gastro-intestinal mucous membrane, protecting it from irritating secretions. It has reputed expectorant qualities, which probably entirely depend upon its action on the throat as it passes through on its way to reach the stomach. Large doses of the infusion act as a diuretic by mildly stimulating the kidneys, and a patient with an *irritable bladder* often finds relief from it. The poultice affords the best medium for applying a continuous moist warmth to *local inflammations;* it relieves tension and promotes resolution, whilst, if matter has already formed, it will meet with less difficulty in working its way to the surface through the softened tissues. The oil is laxative, but is seldom given except as an enema. Externally, it is a favourite application to *burns*, when made into an emulsion with lime water, constituting "Carron Oil."

Lithium—The carbonate and citrate of this element act like the corresponding salts of potassium, over which they possess the great advantage of being less caustic, and of forming much *more soluble salts with uric acid.* The urate of sodium, which exists so largely in the system in *gout*, is converted into the more soluble urate of lithium, which acts as a diuretic as

it is eliminated by the kidneys. This result follows the use of either the carbonate or citrate, the latter being changed into the former in the system; and a solution of the carbonate (1½ dr. to 1 pint) has been found useful by Garrod for removing the *chalky deposits of gout*. The prolonged administration of lithium salts will dissolve uric acid calculi in this way; hence they are called lithontriptics.

Nikanoroff, who has been studying the pharmacology of these salts recently, has demonstrated that they differ extremely from potassium salts in having no depressing effect on the heart, and they closely resemble sodium salts by depriving the red corpuscles of their hæmoglobin, as pointed out by Botkin. When introduced into the stomach he found them eliminated by the urine within three days without increasing the amount of uric acid.

The effervescing liquor is the most agreeable form for administering the drug. 15 grs. may be taken in this way each day.

Lobelia when taken in large doses excites vomiting, depresses, and finally paralyses the respiratory centre and peripheral endings of the vagus in the heart, and causes intense prostration and complete muscular relaxation, acting, like tobacco, as a powerful narcotico-acrid poison, and causing death through its action upon the respiration. It possesses two very decided actions which are useful in medicine—it is a powerful Antispasmodic and Expectorant. It has been given in *bronchitis* and *asthma;* in the former disease, however, it is often uncertain and disappointing, unless pressed to the verge of producing its physiological effects; in the latter it occasionally affords marked relief.

Fourier recently has reported of its powers in *cardiac dyspnœa* and *pulmonary congestion;* and combined with iodide of potassium in *bronchial catarrh* and *catarrhal asthma*.

Ringer recommends dram doses of the tincture every hour; but very often serious depression and sickness follow these doses, and it may be said that lobelia only produces its beneficial antispasmodic effects when a dose bordering on danger has been administered. Small doses prove very useful in relieving *spasm* of the *bowel* caused by fæcal accumulations. It has been used in *whooping-cough*. It increases the action of the skin and kidneys, acting as a diaphoretic and diuretic.

There is no reason why the antispasmodic effects of lobelia may not be intensified by narcotics, and the combination with opium, morphine, or preferably chlorodyne, will give satisfactory results. It can be given with advantage in *catarrhal asthma* along with apomorphine.

℞. Tr. Lobeliae Ether. ʒvj.
Spt. Ammon. Aromat. ʒiv.
Tr. Chloraf. et Morphinae ʒii.
Syrupi Simpl. ad ʒij. misce.

Fiat mist. cpt. each. i. min. tertiis horis p.p.a. ex aqua.

Lupulus.—Hop is a valuable stomachic, increasing the vascularity of the gastric membrane, aiding digestion and promoting appetite, and, by its slight narcotic effects, it promotes sleep in various *irritable* or *delirious conditions*, either when taken by the mouth or made into a pillow, to rest the head upon. It is largely owing to the hop contained in them that malt liquors possess their tonic properties. A bag filled with the dried strobiles, and dipped in very hot water, makes an agreeable fomentation in *colic*, *internal pain*, or *local inflammation*. Lupuline, in 5 gr. doses, is the best form for administration.

Magnesia and its carbonate act in the same way; entering the stomach, they are partly dissolved by the gastric juice and absorbed; the residue passing down the bowel is converted probably into bicarbonate of magnesium, and, acting like the sulphate, though much more mildly, it purges or acts as a laxative. The antacid properties of magnesia are serviceable in *acid dyspepsia* and *heartburn*, whilst tastelessness and freedom from acrid qualities and danger, in large doses, make it a favourite *purgative* for *children*. The carbonate solution is bitter, and is less liable to lead to the formation of concretions of magnesia in the colon, than the lighter powders. Gregory's powder is a valuable antacid laxative tonic. Magnesia can be given in 2 dram doses in milk or lemonade. This latter increases greatly its purgative qualities. The carbonate, by giving off carbonic acid in the stomach, has local sedative qualities not possessed by magnesia. The Liquor Mag. Carb. is an agreeable and mild purgative, and affords the best treatment for acute and chronic *urticaria* in the adult, and for the various forms of *nettle rash* in infancy and childhood; its use will give satisfaction more frequently than any other remedy. It may be elegantly combined in these cases with tincture of rhubarb.

(Dr. Gregory's Colic Mixture.)

℞. Magnesii Carbonatis ℈i.
Tincturae Card. Co. ʒij.
Aquae Anethi ʒss.
Syrupi ʒij. misce.

Fiat mistura sumat cochleare i. min. frequenter in dies.

Magnesii Sulphas is the most certain and safe of saline purgatives. Professor Hay in his famous experiments upon the action of saline catharties, which have thrown a flood of light upon this portion of the field of both Physiology and Pharmacology, has demonstrated the action of this salt. He found that it produced copious intestinal secretion, according to the amount of the dose and the strength of the solution. The low diffusibility of the salt prevented the absorption of the secreted fluid, and thus between retarded absorption and stimulated secretion a large amount of serous fluid accumulated in the bowel until the quantity of liquid amounted to about what would be necessary to form a 5 or 6 per cent. solution of the salt. The peristaltic action of the bowel was but slightly increased, and this increase was owing to the distention caused by the large collection of secreted fluid. The sulphate was split up, and the acid, being more easily absorbed than the base disappeared partially from the small intestine, to return, however, shortly afterwards. Meanwhile, the base (magnesia) was gradually undergoing absorption, but never pursued the same peculiar course of absorption and excretion as did the acid. In this way he explains the remarkable fact, that one-fourth of a purgative dose, if injected into the veins, will cause death, but when swallowed the salt is split up in the canal, the toxic or basic part entering the blood so gradually that it has time to be excreted by the kidneys. These important results were obtained with phosphate and sulphate of sodium and sulphate of magnesium. It was that portion of the salt which remained within the tube that caused the secretion of intestinal fluid, and not the portion absorbed into the blood. When the salt was injected into the blood directly, purgation did not follow, but rapid poisoning by profound depression of both heart and respiration soon supervened. The fluid accumulated in the

intestine after the administration of sulphate of magnesium, and sodium at the expense of the fluid part of the blood, which afterwards recouped itself from the fluid of the various tissues. The weaker the solution of the salt administered, the less fluid was extracted; and if less than 5 per cent. solution were swallowed, no increase in the intestinal secretion from the blood occurred. If, however, a *very* concentrated solution were given, and the canal were quite empty, and no water were swallowed before or after the dose, a profuse pouring out of intestinal secretion, and subsequent concentration of the blood, soon followed. The value of these experiments is very great, when we apply the knowledge derived from them to the treatment of disease. Thus we see that after fasting, a large dose (say 1 to 2 oz. sulphate of magnesium dissolved in its own weight of water) will cause almost as free depletion as if the lancet were used.

Prof. Hay obtained good results when used in this way in dropsies and for the removal of large serous accumulations. The rapid withdrawal of so much serous fluid from the blood being speedily followed by the extraction of large quantities of the transuded fluid from the areolar tissue or peritoneal cavity. Of the various methods by which sulphate of magnesium may be used to produce its ordinary purgative effects, none equals the use of Friedrichshall bitter water. This valuable purgative, in addition to the sulphate, contains a large quantity of the chloride of magnesium, as well as chloride and sulphate of sodium, and other salts which act as mild stimulants to the peristaltic action of the bowel, so essential to the thorough evacuation of the entire canal.

Friedrichshall water, by thus increasing both the secretion and the peristaltic action, produces a result in *chronic constipation* not unlike cascara in some respects; and the writer, by watching its effects, has found that the dose need not necessarily be increased, as is the case with most purgatives. It, moreover, acts upon the liver, and by keeping the skin warm or cold after its administration, valuable *diaphoretic* or *diuretic* effects may be produced by small doses (2 oz.) diluted freely. If given fasting its action upon the bowel is marked, whilst if administered after meals in even small quantities it increases the amount of the urine and urea and lessens the uric acid. Under the regular use of small doses (1 oz.) a surprising increase in the bulk of the fæces results and the appetite becomes markedly increased. In *congestion of the portal system*, the sulphate of magnesium or Friedrichshall water is the speediest and safest cathartic.

The carbonate may be well combined with the sulphate, and if administered in peppermint water, makes a palatable and efficacious purgative, suitable in many diseased conditions.

Manganese Salts act somewhat after the manner of iron, but possess no advantage over it. They are used in *amenorrhœa*, *gastrodynia*, and *anæmia* by some. The black oxide is merely introduced into the Pharmacopœia for making chlorine. When injected into the circulation Kobert found that the paralysis of reflex action which resulted was produced by the destruction of the transverse conducting power of the cord. Death resulted from cardiac depression. For the action of Permanganate of Potassium see under Potassium.

Manna acts as a mild purgative or laxative, and was formerly much used for children. It causes flatulent distention and griping from its irritation of the bowel. It may be given with great advantage in infusion of senna.

Marmor Album is used for making carbonic acid gas.

Mastiche possesses in a feeble degree the stimulating properties of the turpentines. It is eliminated by the kidneys, and is used to lessen the profuse discharge in *chronic suppurative inflammation* of the bronchi. It has been long used in the East as a masticatory to perfume the breath, and it retains a place in the composition of various modern dental preparations, and is used by the pharmacist as an ingredient in some pill masses, to which it gives firmness and body.

Maticæ Folia possesses aromatic and tonic properties of a low order. It is seldom prescribed internally, except with the idea of its acting like cubebs upon the inflamed *urethral surface*. It is used as a local application to *bleeding points*, and the leaf was supposed to act in this way on account of its reticulated structure; but the impalpable powder acts as a local astringent, and is valuable in treating *leech bites* and small *bleeding wounds*. Its astringency, however, is not owing to the traces of tannin which it contains, but probably to its volatile oil.

Mel Depuratum is seldom used in medicine, except as a vehicle for more active remedies. In large doses it acts as a mild laxative. It has been praised for its expectorant qualities, which, if they exist, are probably owing to its local effect upon the throat and fauces, acting as a ciliary excitant by impressing the terminal filaments of the nerves, and by reflex action affecting slightly the secretion in the cells of the bronchial mucous membrane. Externally, honey has been used as a protective application to *boils* and *excoriations*. Its efficacy

in *aphthous* states of the mouth entirely depends upon the borax with which it is associated, pure honey aggravating the condition of matters when applied alone. It has antiseptic properties like sugar. Oxymel is used as a *cough syrup*, and probably its action is purely local.

Menthæ Piperitæ Oleum and Menthæ Viridis Oleum—Identical in action, these grateful aromatics are rapidly absorbed into the system, and behave as mild diffusible stimulants. Coming into contact with the gastric mucous membrane, they exercise at first a stimulating and afterwards a local sedative or *anæsthetic* effect, dispelling *nausea* and correcting *uneasiness*. They correct the irregular painful sensations caused by accumulations of *flatus*, giving speedy relief, probably through a reflex act by driving on the imprisoned gas. In a somewhat similar way the *griping* of *cathartics* is obviated without diminishing their purgative effects. Half a teaspoonful of the essence or 5 minims of the oil may be given in a little hot water and sugar, and repeated every hour if necessary.

Externally, when applied undiluted, these oils produce *anæsthesia* and *relieve the pain of superficial neuralgias*.

Menthol is a powerful Antiseptic and local Anæsthetic. When applied to the skin it destroys sensation, producing numbness without corrosive action, and thus relieves when painted over the course of painful nerves, as in *neuralgia*, *sciatica*, and *pleurodynia*. It relieves *toothache* when applied to the carious cavity, and is a parasiticide when applied to various skin diseases.

Mezerei Cortex—Used now only as an irritant; when applied externally it causes inflammation of the skin and raises the cuticle like cantharides, though uncertain and slow in its action. It has diuretic properties, and was at one time supposed to act as an antidote to the poisons of *syphilis* and *rheumatism*, and to be useful in *inveterate skin diseases*—properties which experience has failed to substantiate.

Mica Panis—Bread-crumb is not introduced into the Pharmacopœia on account of its nutritious properties, but rather for the sake of its physical qualities. It is employed as a soothing application in the form of a poultice to local inflammations, as it absorbs and retains a considerable quantity of hot water. Bread-crumb is also a very good excipient for pill masses, giving both firmness and toughness to brittle pills; when used to make argent. nit. into pills its chloride of sodium should be removed by washing.

Mori Succus—Mulberry juice is a mild laxative when taken in quantity. It contains tartaric acid, and, like it, acts as a refrigerant in *febrile conditions*, probably allaying thirst by its local action on the parched throat and fauces. The syrup is the form in which it is usually administered, but it is seldom used except to impart its beautiful lake colour to mixtures.

Morphine. (See under Opium.)

Morrhuæ Oleum is an easily-digested fat, possessing very high nutritive qualities. Its great efficiency as a restorative agent in *wasting diseases* depends to some extent upon its power of aiding the assimilation of other foods, which would not be absorbed except in its presence. It is more easily absorbed than any other oil or fat. After meeting with the pancreatic juice and bile, it readily emulsifies and enters the lacteal vessels more easily than other oleaginous substances, and it appears to have the power of bringing along with it the oily and nitrogenous elements of the food. Digestion is thus considerably facilitated, the blood corpuscles are augmented, the weight of the body is increased, and a stimulus is given to healthy cell formation, which, to some extent, depends upon fat supply. It is a valuable expectorant, and Brunton believes that it acts by nourishing the newly formed cells in *bronchitis*, which otherwise could not take on the character of mucous cells.

The great utility of cod-liver oil in *wasting diseases* is beyond dispute, and often its effects are decidedly curative in some forms of *chronic phthisis*, and in conditions like *scrofula*, *syphilis*, and *rickets*, depending upon defective nutrition or errors in assimilation.

By directly supplying fat, which is an important element in the composition of the nervous system, cod-liver oil is beneficial in *nervous exhaustion* and *neuralgia*, and hastens repair in various structural and functional affections of the *nerve centres*. In a similar way, by supplying fat where there is much muscular wear and tear, the body weight is kept up; and recent physiological research shows that fats are directly and easily converted into muscular force, and that prolonged exertion can be maintained on oils alone.

The chemical constituents found in cod-liver oil have been constantly regarded as affording a satisfactory explanation of its effects in directly increasing the weight of the body and combating disease; but the small amount of iodine is too insignificant to account for its action, and, moreover, iodine does not produce the beneficial results of the oil when given alone. The biliary matter contained in cod-liver oil undoubtedly assists

the absorption of the oil and hastens its passage through animal membranes.

The writer found, as a result of carefully weighing the subjects of disease under a course of cod-liver oil, that they *increased considerably more than the weight of the oil taken by them.* This holds good also in health, and does not appear to be explained by the increase of appetite which it often produces. It is probable that the oil, by its biliary constituents, causes the absorption and assimilation of food elements not usually finding their way into the lacteals, and nourishes the body independent of its own highly nutritious qualities. The many diseases for which this remedy appears to act as a specific depend upon some deep-seated error in assimilation, which is removed by the continued use of this valuable food and medicine. Hence the slowness of its action in cases of *chronic rheumatic arthritis*, *lupus*, *psoriasis*, &c., as it must first remove the condition upon which these ailments depend before any improvement is noticed in the symptoms.

Cod-liver oil should not be given in febrile conditions of the system, nor in irritable or catarrhal affections of the stomach and intestines—its administration in such cases being often productive of mischief. *Phthisis*, accompanied by high temperature, is not benefited by it, but a slight degree of fever should not prevent its administration if the digestive organs are healthy; and if in such cases an effervescing mixture of bicarbonate of potassium with lemon juice be given with a minute quantity of morphine for three or four days *the oil will be often relished afterwards*, and the febrile symptoms and discomfort frequently disappear.

No advantages follow the mode of giving cod-liver oil in large doses except that the surplus quantity generally acts as a mild purgative, but it often upsets the stomach and causes slight congestion of the liver. Teaspoonful doses will be found enough to begin with in all cases, and it is a good rule to confine its administration to bed-hour for the first few days. It should always be given *soon after a meal.*

Various plans are suggested to cover its taste, and many forms are vaunted for this purpose, but it is probable that the efficacy of the oil is diminished by the saponification and chemical changes which it undergoes in producing many of the so-called emulsions. The combination with extract of malt is a valuable one.

It can be emulsified by gum acacia or tragacanth, and flavoured with cinnamon, lemon, or bitter almond. This latter is the best, but, as a rule, it is advisable to begin with the oil in small doses, and leave the vehicle to the taste or caprice of

the patient, who may try water, milk, coffee, wine, orange juice, beer, punch, &c., according to fancy. Below will be found a formula for an emulsion containing one-third of its bulk of cod-liver oil, in no way injured by the ingredients used for its emulsification. Some patients can swallow the oil without any trouble, but the unpleasant eructations afterwards cause intense discomfort. In these cases the addition of any flavouring ingredient is a mistake, and the only preventative (if the patient can tolerate it) is to hold the oil in the mouth for a time, and cause it to be thoroughly mixed with saliva by moving the tongue round the inside of the cheeks. Where this can be tried, the oil will be found to rapidly digest and give no subsequent trouble.

When no method can be found by which the oil is retained in the stomach, then recourse must be had to inunction; two to four drams should be rubbed into the skin after a hot bath, and there can be no doubt that good often follows this practice. *The process of inunction is of the greatest use in the wasting diseases of children.* After about one tablespoonful is well rubbed into the skin of the abdomen, a deep flannel binder should be put on. This in a few days becomes saturated with the oil, and should be covered with as much thin mackintosh as will surround the body. The inunction should be repeated twice a day, and the flannel should be changed not oftener than once a fortnight.

The writer is satisfied that by the persistent and intelligent application of the oil in this manner results may be obtained of the most valuable and lasting description. The hypodermic injection of the oil may be tried as recommended by Shoemaker for other oils.

(Cod-liver Oil Emulsion.—Squire.)

℞ Pulv. Tragacanthae gr. xxvij.
Syrupi ʒij.
Aquae ʒiss. misce et adde
Olei Morrhuae ʒiiss.
Aquae Distillatae ʒiiss.
Olei Limonis min.xij.
Olei Amygd. Essent. min.j.
Spt. Vin. Rect. ʒvj.
Misce, secundum artem.

Moschus is a diffusible stimulant, acting directly upon the nervous system and dispelling spasm. It has enjoyed some reputation in low *febrile* and *typhoid states* with great nervous *excitement* followed by *prostration* and collapse. It acts as a stimulant to the respiratory centre. It has also been used in various disorders supposed to be of spasmodic origin. The dose (10 to 20 grs.) costs so much that the use of the drug is now practically confined to cases of such gravity that there is little opportunity given to test its questionable properties, and, moreover, it is difficult to get it free from adulteration.

Myristica—Nutmeg is a well-known aromatic stomachic remedy, used for its agreeable flavour. In small doses (10 grs.) it acts as a stimulant to the stomach by increasing the flow of the gastric juice, aiding digestion and promoting the desire for food. In the same way it acts further down the canal by dispelling accumulations of gas and relieving *colic* and *spasm*. In large doses it is a *powerful and even dangerous narcotic*, acting upon the cerebrum and producing symptoms like those following poisonous doses of camphor, viz., vertigo, giddiness, and coma.

Myrrha possesses the power, in common with other gum resins, of stimulating mucous surfaces, and so influencing their relaxed conditions in disease that the abundant secretion is checked; thus *bronchial catarrh* and *chronic cystitis* are improved; and it appears likewise to relieve *leucorrhœa* and diminish excessive secretion from the *cervical mucous surface*. Its reputed emmenagogue properties appear to rest upon very questionable foundation.

Locally, myrrh has a very beneficial tonic action upon *diseased mucous surfaces*, and may be applied to *spongy gums* and *aphthous conditions of the tongue*. *Foul ulcers* are likewise benefited by it.

Nectandræ Cortex—An astringent tonic. (See Beberine.)

Nitro-glycerine acts like Nitrite of Amyl, but its effects are more persistent. One or two of the official tablets cause, in about 3 minutes, throbbing and fulness of the head, soon spreading over the entire body; the increase in the pulse rate, and flushing of the face, is considerably less than what results from amyl. The blood pressure falls, the temperature is but slightly depressed in ordinary doses, but giddiness and severe frontal headache often last for a considerable time. If the dose of nitro-glycerine be increased the pulse and respiration are greatly quickened, paralysis of the motor and sensory centres of the cord occurs, the heart becomes very much weakened, and the respiration slower, and finally death from

paralysis of the respiratory centre supervenes, and the blood assumes a dark chocolate colour, as in poisoning with nitrite of amyl and nitrites of sodium and potassium.

Dr. Hay has recently investigated these substances from a chemical standpoint, and he believes "that he is warranted in concluding that the activity of nitro-glycerine is due to the nitrous acid which is formed by its decomposition within the body." He shows that the astonishing activity of so small a dose as $\frac{1}{100}$ grain of this substance is owing to its being absorbed unaltered by the stomach, which decomposes to a great extent the ordinary nitrites, and the *nascent* nitrous acid formed by its final decomposition in the blood and tissues exerts a more incisive action than the nitrous acid of a nitrite. (Nitro-glycerine is a *nitrate* of glyceryl.)

Murrell has found that excellent results follow its administration in *angina*, where its action, though not so prompt, is much more lasting than that of amyl. One tablet may be given every 3 or 4 hours, and the dose gradually increased till 3, 4, or 6 be taken during the threatening of an attack. It has been successfully used in *epilepsy*, *Bright's disease*, *neuralgia*, *puerperal eclampsia*, *asthma*, *migraine*, &c. It has been used with some success when given with elaterin in *myxœdema*, and it has the power by dilating the blood-vessels of the body to cut short attacks of *ague*, *renal* and *hepatic colic*. It may be given in 1 to 3 or 5 minim doses of a 1 per cent. solution, but the elegant official tablets introduced first by Martindale answer every purpose. They are useful in *sea-sickness*.

Nux Vomica, and Strychnine, its active principle, were found by Magendie to act directly upon the spinal cord. When given in moderate doses, strychnine is found to act as a mild stimulant or exciter of the centres of those nerves going to supply the striped muscular tissues of the body. Experiment proves that its characteristic effects are not produced by its action upon the brain nor upon the muscles themselves, nor upon the nerve-trunks or endings, but only upon that part of the cord where the motor *centres* are situated. A large dose acts as a violent irritant to this part of the nervous system, and also to the vaso-motor and respiratory centres, causing convulsions of all the voluntary muscles, soon followed by spasm of the respiratory apparatus, and causing death by rigidity of the diaphragm and thoracic muscles.

After death from strychnine poisoning the motor nerves are found to be impaired, and the experiments of Vulpian and others prove this paralysis to be owing to the exhaustion caused by the violent contractions preceding death, and only

slightly through a direct action of the poison upon the nerves themselves.

The vaso-motor centre is stimulated, and the arterial pressure rises. This rise is exaggerated by the asphyxial condition induced by the convulsions, the blood being loaded with CO_2, which irritates the vaso-motor centre still more. The violent contraction of the muscles retard the circulation in the adjacent vessels, and the blood pressure is thus further increased. The cardiac ganglia are stimulated; and the least stimulus, as a draft of air, produces powerful reflex spasms.

The symptoms closely resemble those of tetanus, but rigidity does not begin in the muscles of the jaw; the convulsions are *tonic* in tetanus, and *clonic* in strychnine poisoning.

The phenomena after the administration of strychnine come on rapidly, and soon pass off, or are fatal; and there is no history of a wound or operation, as in tetanus.

Small doses after a time stimulate the *sensory nerve centres*, so that ordinary sensations are felt with unusual sharpness and keenness. The special senses and mental faculties thus are also quickened. In large or poisonous doses the mind is not further affected but remains clear to the last.

Owing to its stimulating action upon the reflex function of the cord, strychnine is useful in the treatment of many neurotic affections. In *paralysis* it is invaluable when given in suitable cases. Thus, in *hemiplegia*, *paraplegia* of *reflex origin*, and in various forms of *local paralysis*, strychnine is the most serviceable remedy we possess; but it should not be given—(1) in recent cases; (2) whilst *rigidity* exists; or (3) in cerebral paralysis with continuance of head symptoms; (4) nor is it of much use where *great* wasting or fatty degeneration of the affected muscles is present; nor (5) where the muscles do not respond to the electric current.

Various spasmodic diseases are said to be cured by strychnine—*chorea*, *asthma*, and *epilepsy*.

Strychnine acts most beneficially upon the alimentary canal; being a pure bitter, it increases the tone and vascularity of the stomach, improves appetite, and promotes digestion; and in *atonic dyspepsia* and various *chronic catarrhal affections* of the gastric mucous membrane it acts as an excellent tonic. Further down the canal its effects are even more marked; by its stimulating power over the reflex action of the cord, it greatly increases the muscular contractions of the intestinal tube, counteracting *constipation* and *fæcal accumulations*, and affording a valuable addition to purgatives. These effects are so marked that occasionally the stools are much altered in

size, *and may be seen to present the attenuated appearance observed in stricture of the rectum.*

In the same way, nux vomica or strychnine proves useful in *prolapsus* of the *anus* and *atony* of the *bladder*, and has a strong aphrodisiac effect, and is useful in *sexual debility*. Functional *amaurosis* often very rapidly yields to strychnine in $\frac{1}{20}$ gr. doses. By stimulating the respiratory centre it relieves the *night sweats of phthisis*.

In *local paralysis*, the hypodermic injection of strychnine will be generally found to give splendid results. From $\frac{1}{60}$ to $\frac{1}{30}$ of a grain injected into the muscular substance is soon followed by increased growth and power. As a rule, it is said to be useless in cases where the muscles will not respond to the slowly interrupted current, but beneficial results will, undoubtedly, follow its use in many cases where electrical stimulation cannot be detected. Barwell injects $\frac{1}{20}$ to $\frac{1}{12}$ of a grain in *infantile paralysis*, but it is not advisable to begin with more than two or three minims of the official liquor.

Strychnine accumulates in the system by causing contraction of the renal vessels which prevents its own elimination, and its administration should be carefully watched. In a case where death *almost* resulted, the writer found that the urine afforded not the *slightest trace* of strychnine, though the patient had been convulsed for 7 hours.

It is advisable not to begin with a larger dose than $\frac{1}{30}$ gr., which may be gradually increased to the $\frac{1}{12}$ gr. 10 to 12 minims of the tincture of Nux Vomica, or $\frac{1}{2}$ grain of the extract, will be enough for a fair dose. Death has resulted in man from $\frac{1}{2}$ gr. strychnine.

Recently Brugnoli has reported of the great benefits to be obtained from nux vomica in *phthisis* and *typhoid fever*, and in the *neuroses of organic life*. He insists upon its decided power of correcting the abnormal and altered function of the pneumogastric and great sympathetic.

By its quickening or stimulating effect upon the sensory centres, the writer has found strychnine to be sometimes injurious in various *hysterical* and *nerve ailments* where there is undue irritability of the peripheral sensory fibres. It acts more powerfully from the rectum than if swallowed.

Strychnine is antagonistic to chloral and alcohol, and the writer believes that poisonous doses of alcohol afford the safest and best hope of success in strychnine poisoning.

The following forms will be found convenient for the administration of Nux Vomica and its alkaloid :—

(A good Tonic in Dyspepsia or Paralysis.)

℞. Tinct. Nucis Vomicae ℥v.
Acid. Nit.-Hydrochlor. Dil. ℥vj.
Tinct. Aurantii ℥j.
Inf. Gentianae Co. ad ℥x. misce.
Fiat mist. cujus cpt. ℥ss. mensura ex ℥i. aquae ter in die ante cibos.

(Pills for Constipation.)

℞. Ext. Nucis Vomicae gr. ss.
Ferri Sulph. Exsic. gr. j.
Ext. Aloes Socotrinae gr. ¼.
Pulv. Glycyrrhizae gr. iss. misce.
Fiat pil. mitte tales xxiv., i. mane nocte quoque sumend.

Olivæ Oleum is one of the best official laxatives; given in ounce doses it produces soft, painless motions, and, by its soothing qualities, it protects the bowel from contact with irritating secretions, foreign matter, or partially digested food. Thus it is highly beneficial in *constipation, inflamed* or *ulcerated hæmorrhoids*, and *fissure of the rectum* or *anus;* it is especially useful as a laxative, in ½ to 1 oz. doses, in cases where the bowels have been locked up by opium. In small quantities it is a nutritious food. Its hypodermic administration has been advocated.

Externally, its bland unirritating qualities have obtained a place for it in various liniments, poultices, plasters, and ointments.

℞. Olei Olivae (Recentis) ℥vj.
Cpt. cach. unum magnum ex paulula lactis omni mane.

Opium and Morphine resemble each other so closely in their action that the brief description here given will apply to both.

A moderate dose of opium will act upon the alimentary tract from the mouth to the anus; dryness of the lips, tongue, throat, and gullet will be evident in a very short time, secretion being stopped or diminished; gastric juice ceases to flow, digestion is retarded, and the appetite fails. The intestinal fluids are not secreted as before, and constipation ensues after a time. Arterial tension slightly rises, the pupils contract, and the nervous system is influenced; first, there is a sense of pleasant activity of the cerebral faculties, ideas flow with speed through the mind, and exhilaration bordering upon mild intoxication may be noticed, soon followed by a calm of variable duration, which passes into drowsiness and sleep; often the stage of mental activity is absent, and it is always best marked in those accustomed to the use of the drug.

Headache, mental confusion, and malaise, with digestive disturbance, often remain after waking.

In fuller doses the above symptoms are present, only in greater intensity; the stage of stimulation is *shorter*, the somnolency comes on swiftly, and soon passes into sleep, with irregular slow breathing, and, if the dose be large enough, coma supervenes. In poisonous doses sleep comes on so rapidly that the excitement stage is not apparent. The pupils are strongly contracted, the breathing, at first slow and stertorous, becomes feeble and irregular, the face is cyanosed, and the skin cold and moist; the pulse, at first full and strong, becomes more and more feeble and rapid; the coma, at first incomplete, and out of which the patient was easily aroused for a time, becomes deeper and more profound, until finally no stimulus appears to arouse the least response, and death occurs from asphyxia caused by paralysis of the respiratory centre.

Opium checks every secretion in the body except that of the skin and mammary glands.

Only the higher cerebral centres are affected by full doses, but if repeated, gradually the basilar ganglia are influenced. The spinal cord does not escape, as may be often noticed by the retention of urine following large doses, and the sensory nerve fibres throughout the body are more or less under the spell of opium, for sensibility becomes diminished, apparently by the conductivity of the impressions being less perfect. Brunton found that opium influenced the peripheral terminations of the vaso-motor nerves, and thus diminished or prevented the reflex dilatation of the vessels, which always occurs

when local irritation is present. This, he thinks, is the probable explanation of how opium cuts short inflammations.

These two distinct effects produced by opium—cerebral *excitement* in the first instance, and *sleep* afterwards—vary very much in different individuals, and also to some extent depend upon the way in which the drug is administered. Thus, in nervous excitable women, the first effect may be the only one noticeable, sleep not following; while, again, a very large dose will likely produce only the second effect, no excitement, or only a momentary flash being observed, sleep quickly supervening. By graduating the dose, the opium-eater can avoid the second stage, and prolong the excitement indefinitely.

Sleep results from the power of the drug to diminish or depress the functional activity of the cerebral cells, and at the same time to produce a state of anæmia of the brain, in which both arteries and veins are empty. The extreme contraction of the pupil, characteristic of opium poisoning, is clearly *centric*, caused by the action of the drug upon the cerebral cells.

The effects of opium poisoning upon the pulse are explained by the action of the drug upon the inhibitory cardiac centre at first causing the slow full beat; the intracardiac ganglia also are at first stimulated, and afterwards greatly depressed.

Nothnagel has recently studied the action of morphine upon the bowel, with the view of explaining its constipating effect. By opening the abdomen of a rabbit in a salt bath he found that the application of a sodium salt to the intestines caused an ascending constriction. Small doses of morphine prevented this, whilst larger doses exaggerated it, and he found by further experiments that this exaggeration was caused by the morphine *stimulating the inhibitory nerves of the intestine* through the splanchnics.

Large doses injected into the jugular purge rapidly by tetanising the intestine. Moderately large doses paralyse the vermicular contraction, while minute doses (1 drop laudanum) have been found to increase it by Brunton, who also noticed that by allaying the reflected irritation caused by an inflamed ovary with a small dose of opium, purgation took the place of constipation.

These hypnotic and anodyne qualities of opium render it the most important drug in the Pharmacopœia, and its application in disease is so extensive that only a brief reference to its therapeutic uses can be made.

To produce *sleep* in all conditions requiring it, in the restless *delirium* of fevers, and in *nervous prostration* from whatever cause, opium is the best known hypnotic; its good effects are

seen in *delirium tremens* and in *acute* and *chronic mania* and *melancholia*. It is contra-indicated when the brain is congested and the eyes suffused and pupils small.

As an analgesic or pain reliever opium or morphine surpasses all others in certainty of action and safety. It relieves the pain of *sciatica*, *neuralgia*, *lumbago*, *gastralgia* and *cancer*, and soon removes the agony caused by the passage of *renal* or *hepatic calculi*. In these cases the hypodermic injection of morphine is by far the best form in which to administer the drug, and it is a mistake to regard its effects as merely palliative, for *sciatica* is often *cured* by a single insertion of the needle, a result which is not met with when morphine is given by the mouth. The physician must guard against the patient getting into the habit of using the syringe too often, as there is great danger of the opium habit becoming established; and though space prevents any description of the evils arising from opium eating, a word may be said about its treatment. The writer has, after trying various plans, found success to crown the following:—He first gets the patient to resolve upon breaking off the habit, and he then has whiskey administered to him in such doses as to keep him markedly under its influence for several days, at the end of which time the case is treated as one of ordinary alcoholic excess, except that the spirit is gradually withdrawn.

Though this plan is open to the risk of establishing a more terrible disease than that which it is intended to cure, still it appears worth trying, but should only be used in cases where a considerable remnant of will remains. The writer succeeded with it completely in one hopeless case.

Cough is relieved by opium, but some discrimination should be exercised in the exhibition of the drug for this purpose. In cases of *exhausting bronchitis*, with *profuse expectoration* where there is only enough cough to empty the tubes, this remedy is a dangerous one; but where a harassing, frequent cough wears down the patient's strength, without much secretion, then opium is a blessing. It acts in these cases by diminishing the excitability of the respiratory centre.

In *acute inflammations*, opium gives the best chance of cutting short the disease and guiding it to a safe termination. If given at the very onset of formidable affections like *acute peritonitis*, opium may be safely taken to a surprising extent; and the amount of pain present affords the safest measure for the dose. Dram doses of the tincture may be in such cases administered, and to guard against the risk of its lying in the stomach and being suddenly absorbed after an interval, it is wise to give it in several ways alternately—endermically; by

the mouth or rectum; or hypodermically. It has long been a recognised fact that opium given with no sparing hand will often save life in *severe inflammations*, especially of *serous membranes*.

The peristaltic action of the bowel is diminished and thus it is doubly useful in *inflammation* of the *peritoneum;* and from its tranquillising effect upon the circulation it is invaluable in *hæmoptysis* and other *hæmorrhages*.

Small doses ($\frac{1}{10}$ gr. solid opium) have been found successful in the treatment of *irritative dyspepsia*, by Graves and Trousseau; and all *enteric affections* with excessive secretion, after the irritating cause has been removed by purgatives, are benefited by opium;—thus, *dysentery*, *enteritis*, *cholera*, &c., are so relieved.

After *abdominal surgical operations*, a morphine suppository is followed by great benefit, and opium has been found useful in averting the rigor liable to follow *urethral injuries* from whatever cause. The presence of severe pain is always an indication for a large dose of this drug; women are more susceptible to morphine or opium than men; children bear both very badly, and the physician will be wise who makes the rule, in the first few years of his practice, never to give opium in any form to a child under a year old. Disease of the kidneys has been said to be a barrier to the use of opium; but recent experience shows that the hypodermic injection of morphine may be beneficial in *uræmic convulsions*.

There is, however, nothing which seems to influence the dose of the drug like idiosyncrasy, some bearing very small doses badly; and the after evil consequences—headache, nausea, intolerable itching, &c.—vary much in different subjects.

The various alkaloids found in opium produce different effects when administered separately—thus,

Morphine, Narceine, and Papaverine are highly hypnotic; while Thebaine and Codeine are very exciting, acting as convulsants, and Apomorphine is a violent emetic; but it is generally only with morphine that the physician has to deal. It differs from opium in being (1) less astringent and constipating; (2) less powerful as a diaphoretic; (3) it possesses less power over acute inflammations, especially in the abdomen; (4) it is less likely to cause excitement, headache, and nausea; (5) it is more decidedly hypnotic and anodyne, and more liable to cause itching and retention of urine.

Morphine and atropine are antagonistic to each other, and the dangerous symptoms often following the hypodermic injection of morphine are certainly less likely to occur if $\frac{1}{100}$ gr. of atropine be added to each dose, and the combination is more

effective. Not more than $\frac{1}{6}$ to $\frac{1}{4}$ gr. of morphine should be given for the first time by the hypodermic method. Externally opium has little, if any, activity when applied to the unbroken skin.

Of the various official preparations, none equal in certainty and uniformity a pill made out of the crude opium; powdered opium is about $\frac{1}{8}$ stronger. Both these preparations may be given in 1 to 2 gr. doses; and next to them in constancy comes the tincture, which will, in ordinary cases, produce sleep in $\frac{1}{2}$ dram doses. The bimeconate of morphine produces very little after ill consequences. The favourite Dover's powder expends itself chiefly upon the skin, which it stimulates more than a much larger dose of either of its constituents would do if given singly. One grain of morphine is equal in power to about 6 to 8 grs. of opium.

℞. Liq. Morph. Hydrochlor. ʒss.
Aq. Lauroceras. m. xv.
Pot. Bromidi gr. xxx.
Aquae Chloroformi ad ʒi.

Fiat haustus, hora somni sumendus.

Os Ostum—Bone Ash is only employed in the making of phosphates of calcium and sodium.

Ovi Albumen—The liquid white of the egg—consists of about 14 parts coagulable albumen, 3 of mucus, and 83 of water, with traces of salts, and it is highly nutritious, supplying to the blood an element which is found in most tissues. After digestion, which changes it to a crystalloid albumen, it is again altered in the liver. It is introduced into the Pharmacopœia as a test for metaphosphoric acid in Acid. Phosph. Dil., and it is used to coat pills and clarify liquids.

It is used as an antidote in poisoning by mineral salts, as mercury and copper, as it forms insoluble compounds with these.

Ovi Vitellus—Egg-yolk is highly nutritious, consisting of nearly 30 per cent. of oil and crystallisable fat, and 18 per cent. of albumen and some phosphorus. It is used in making emulsions, and enters into Mist. Spt. Vini Gallici.

Oxymel and Oxymel Scillæ. (See under Mel and Scilla).

Papaveris Capsulæ resemble opium in their action, which is feeble and uncertain; the extract, when carefully prepared, is a good hypnotic, not so liable to cause headache and nausea as opium. The decoction of poppies has long enjoyed a reputation as an anodyne when applied to various local inflammations; its good effects are partly owing to the moist heat of the application.

Paraffinum—Hard paraffin is introduced into the new B.P. not for any direct therapeutic properties, but to make a firm, bland, and unirritating basis for various ointments. Its high melting point, hardness, and unchangeableness confer special obvious advantages upon ointments containing it.

Soft Paraffin, Petroleum Jelly, or Vaseline, or Petrolatum, is not affected by the majority of substances, and exhibits no tendency to become rancid.

The absence of irritating or changeable constituents in it, and its absolute freedom from taste, smell, or grittiness, render it the best basis for ointments ever introduced.

It is insoluble in water, and mixes with oils in all proportions, and it dissolves most alkaloids. It is, however, not a good basis of we wish to get these substances *absorbed* by the skin.

Its low melting point is a disadvantage, as when applied to the skin it melts and becomes quite liquid, and soaks into the dressings or garments, often leaving the incorporated substance almost dry and in direct contact with the skin; the addition of hard paraffin, as shown by Martindale, obviates this, and a faultless basis is obtained by a mixture of these two substances. There will occasionally be met with, patients in whom vaseline will cause considerable cutaneous irritation. Lard or any bland animal oil should be used when we wish to obtain the absorption of the active ingredient by the skin. Thus ointments of the alkaloids should be made with lard, whilst the antiseptic remedies, as carbolic, boracic, and salicylic acids, eucalyptus, creasote, &c., are better when compounded with vaseline.

Alone, it forms an excellent and bland application to *eczema*, *intertrigo*, *burns*, *sores*, *scalds*, and almost every conceivable irritated condition of the skin.

Pareiræ Radix.—After being swallowed, a large dose acts as a mild laxative. After its absorption, it is eliminated by the kidneys, which it stimulates, thus acting as a diuretic; and, as the active principle passes over the mucous membrane of the genito-urinary tract, it exercises a soothing and tonic influence on the bladder, and in cases of *chronic cystitis* the

excessive secretion is diminished. In the same way *suppurative kidney affections* are relieved, and sometimes unhealthy conditions of the *urethra*, causing *gleet* and smarting pain after micturition, are relieved by pareira. Its effects seem intensified by combining it with alkalies, and the liquid extract is the most certain and elegant form to administer the drug. Its active principle undergoes change in the blood, for when injected for *gonorrhœa* and *cystitis* it does not appear to have any local beneficial action upon the diseased membrane, though occasionally it appears to act like an ordinary tonic when admitted to the stomach.

℞. Ext. Pareirae Liq. ℥ij.
Liquor. Potassae ℥iv.
Decoct. Pareirae ad ℥x. misce.
Fiat mist. cpt. cochleare amplum tertiis horis ex cyatho vinosa aquae.

Pepsin (the principle found in the gastric juice) is a ferment or enzyme, possessing the power in presence of warmth, acidity, and moisture of converting albuminoid and proteinaceous foods into peptones. Pepsin will work this change outside the body, and there can be no doubt that a similar alteration takes place when pepsin is administered with food to a stomach incapable of secreting enough juice for its own wants. This deficiency of gastric juice, moreover, is known in many cases of *atonic dyspepsia* to be the direct cause of the indigestion, and hence it is that pepsin in such cases becomes so valuable. In *irritative dyspepsia*, with excessive secretion of acrid gastric fluid, pepsin generally does harm unless given in one very large dose (30 grs.) Lactopeptine will be found the most satisfactory and certain form in which to administer this drug.

Three facts should be remembered in prescribing pepsin—(1) that it is a *ferment*, and large doses are not generally necessary, since its activity depends more upon the *state* of the stomach's contents than upon the *amount* of the ferment administered; (2) that it acts as a direct stimulant to the gastric mucous membrane, which it causes more copiously to pour out its own secretion; and (3) that in the class of cases most requiring pepsin an acid is also necessary. It is recommended in the *diarrhœa of children*, depending upon the presence of

quantities of partially digested food passing along the intestines. It is useful in some forms of *vomiting* and *nausea*, probably caused by imperfect digestion. Large doses of pepsin will be found to act as a mild purgative, possibly by causing the absorption of bodies which are afterwards eliminated. Often in *distressing dyspepsia*, accompanied with large quantities of gas being rapidly emitted from the stomach, lactopeptine speedily gives relief.

Rennet, or milk to which more pepsin is added than is necessary to cause coagulation, is a tempting form in which to administer this remedy in *atonic dyspepsia*. Pepsin added to *nutrient enemata* greatly increases their chances of being absorbed. Pepsin has been applied to the false membrane in *diphtheria* with the view of causing its digestion; and recently it has been advocated as a remedy for *diabetes* by Giovanni.

Phosphorus in minute doses is a tonic and stimulant to the nervous system, probably by acting as a restorative and supplying food to nerve tissue. The mental faculties seem more active, the circulation is quickened, and the pulse rises; the temperature is said to rise also; the products of waste are increased in the urine; and the appetite increases, whilst the nutrition of the body also is improved. After a considerable time the bones are affected, osseous deposit filling up the medullary canal, and it has been proved by Wegner as the result of experiments upon animals, that the cancellated tissue becomes compact bone.

In larger doses, vomiting, purging, albuminuria, and the ordinary signs of irritant poisoning supervene, only they may first show themselves *several days after the first dose has been taken*—with cardiac weakness, reduction of temperature, jaundice, convulsions, and death, after which are found fatty degeneration of the liver, blood-vessels, and muscular tissue generally. These symptoms are not unlike those observed in *acute yellow atrophy of the liver*.

In chronic phosphorus poisoning the hepatic connective tissue is increased and cirrhosis of the organ results, with marked fatty degeneration. This latter change is produced by the *increased metabolism* and *diminished oxidation* which characterises the action of the drug.

From its restorative effect upon the nervous system, phosphorus has been extensively tried in *neuralgia*, on the ground of this affection being always associated with a more or less impoverished condition of the diseased nerve. Sometimes benefit follows it administration, but it can hardly be said to afford as good results as the longer tried and better known plans of treatment. It is valuable in cases of *simple brain*

exhaustion from prolonged mental strain; and in many diseases characterised by wasting or atrophy of the nerve centres its good effects have been occasionally observed. It has marked influence on the centres which preside over the *reproductive act*, and is a reliable aphrodisiac in cases of functional loss of power.

In affections depending upon mal-nutrition, as *pernicious anæmia*, or *leucocythæmia*, phosphorus will be found a valuable remedy. Kassowitz has obtained most marked success with phosphorus in *rickets*. He has reported the results of 560 cases, and states, that cranio-tabes of a most marked character, involving both the occipital and parietal bones, disappeared completely in from four to six weeks; these effects were obtained in hundreds of cases. Children, he says, who had never been able to stand or sit upright, were found running about after taking phosphorus for one or two months. The dose for a child 12 lbs. weight was from $\frac{1}{120}$ to $\frac{1}{60}$ gr. in the day. Phosphorus has been recently used in *tubercular meningitis* and *diabetes*, but with very doubtful benefit. Its stimulating action upon the skin has led to its questionable employment in developing the suppressed rashes of the eruptive fevers, and as a substitute for arsenic in *chronic scaly skin diseases*. From its marked influence over the growth of bone, it will be of great service as a constitutional treatment for *ununited fractures*, especially during pregnancy.

It has long been a recognised fact that the *fumes* of phosphorus will cause disease of the jaws, leading to exfoliation of the bone, and it is certain that this action is a local one, caused by the vapour reaching the alveolus through a decayed tooth. It does not follow the internal administration of the drug, even in poisonous doses, and only affects those exposed who have caries of the teeth.

Not more than $\frac{1}{60}$ grain should be given at first, and its effects should be carefully watched. The phosphorated oil may be conveniently given in gelatine capsules, each containing 5 minims, or 3 grs. of the recently prepared official pill may be prescribed.

For *Phosphate* and *Hypophosphite of Calcium* and *Phosphoric Acid*, see under Calcium and Acid. Phosphoricum. None of these substances possess the therapeutical virtues of free phosphorus—which clearly enters the system and remains in the blood as the element, phosphorus—and not, as has been supposed, after its conversion into phosphoric acid or a salt. Compounds of phosphorus in which the affinities of the non-metalloid are not completely saturated, do produce poisonous results, not unlike phosphorus. They are not, however, used medicinally.

Physostigma and Eserine.—Calabar bean is a deadly poison, long used by the West Africans as a superstitious ordeal for determining the guilt or innocence of suspected witches.

Minute doses cause vomiting, colic, and diarrhœa, and stimulation of the voluntary and involuntary muscles throughout the body, with increase of blood pressure and salivation. Repeated doses of $\frac{1}{2}$ grain of the alcoholic extract soon produce more serious symptoms—the anterior and posterior cornua of the cord become depressed, producing motor paralysis, extinction of reflex irritability, and only partial loss of sensation. The cerebrum remains unaffected and the mind is clear; the pupils contract; the respiratory centre and medulla are soon paralysed, producing death by asphyxia, through stoppage of the respiration. The heart, at first stimulated, becomes finally depressed.

Physostigma contains two alkaloids—Eserine or Physostigmine, and Calabarine; the former produces effects resembling those produced by the bean itself, whilst the latter causes tetanic convulsions like strychnine. They are excreted by the saliva and bile, but not by the urine.

Calabar bean is antagonistic to strychnine and atropine, and may be tried in cases of poisoning by these drugs. It has been used in *tetanus*, and in various convulsive diseases, in *acute mania* and *general paralysis of the insane*, and, in minute doses, for *chronic constipation* and *bronchitis*, with the view of stimulating the involuntary muscular fibre ($\frac{1}{3}$ gr. of the extract). It should be given hypodermically. It is for its local action that Calabar bean is so valuable in ophthalmic practice; the alkaloid—Eserine—applied to the conjunctiva produces contraction of the pupil, diminishes intra-ocular tension, and causes spasm of accommodation. The official discs or a few drops of a solution of the sulphate (2 grs. to 1 oz.) are used for this purpose—(1) to counteract the effects of atropine; (2) to prevent prolapse of the iris after *wounds of the cornea;* (3) to diminish the amount of light falling upon the retina in hypersensitive states or inflammations of the eye, as in *strumous ophthalmia*, *ulcers*, &c.; to diminish intra-ocular pressure in *glaucoma*, and *perforating keratitis:* (5) used after atropine, to break down the adhesions resulting from *iritis.*

Pilocarpine.—See Jaborandi (page 410).

Pimento, like cloves, is a stomachic, and though in large doses it acts as a stimulant of some power, still it is seldom employed in medicine, except as a flavouring ingredient or

adjuvant to purgatives. Like pepper, it improves digestion, and increases the vascularity of the mucous membrane when mixed with food. Hence it may be taken as the type of condiments. The essential oil of allspice, in 3 to 5 minim doses, is an agreeable remedy for flatulency and accumulations of gas in the intestines.

Pini Sylvestris Oleum acts in a similar way to turpentine. It has been used as a mild rubefacient in *chronic rheumatism* and various rheumatic and *joint* troubles. The vapour, by its stimulating and astringent effect upon the inflamed bronchial membrane, has been successfully used in *laryngitis*, *bronchitis*, and *phthisis*. It has also been used as a bath in *rheumatism* (½ oz. to 80 gals. of hot water).

Piper Nigrum resembles pimento in its stomachic qualities. It has been supposed to possess febrifuge properties; but evidence is wanting of any reliable effect of the drug in this direction. It increases the frequency of the pulse slightly, and stimulates the heart. After circulation in the blood it is eliminated by the kidneys, which it stimulates, and certainly at times increases the amount of their secretion, but its diuretic action is uncertain; it imparts to the urine a characteristic odour. In passing over the genito-urinary tract it exercises a beneficial influence upon the bladder and urethra, and has the power of bracing up the relaxed and chronically inflamed mucous membrane of these parts in *gonorrhœa* and *gleet*. In this respect its action resembles that of cubebs, and it may stimulate, by reflex action, the genital organs, and possibly aggravate matters in the acute early stages of the disease. There is no evidence that it is eliminated by the mucous membrane of the lower part of the alimentary canal, though patients often, when questioned, will report that a sensation of warmth and comfort is felt at the end of the gut after the free use of pepper. This may, however, be caused by the *excess* of the remedy which passes through unabsorbed; nevertheless, pepper is decidedly beneficial in inflamed and relaxed conditions of the mucous membrane in the neighbourhood of the anus. In *hæmorrhoids* its good effects will be found by giving the official confection in teaspoonful doses three times a day. If cubebs be added, and copaiba balsam substituted for the honey, an elegant preparation results, which will seldom fail to arouse a healthy action in relaxed and painful affections about the anus; or the following formula may be used with or without the cubebs, the glycerine being an active substitute for the inert honey:—

℞. Pulv. Piperis Nig.
,, Carui Fructus.
,, Cubebae ana ℥ss.
Glycerini q.s. misce.
Fiat electuarium cuius capiat cochleare parvulum ter in die.

Pix Burgundica is a mild rubefacient, and its physical qualities render it suitable as a basis for plasters. It is in this form that the drug is generally employed, and the good effects which have followed its application in *lumbago*, *rheumatism*, various painful *joint* and *nerve* troubles, have been attributed to some special stimulant or anodyne action which it was supposed to possess. It is, however, more likely that any good effect following the use of pitch, soap, resin, and various other plasters may be explained upon the hypothesis that the part after the application of the plaster is protected by it from variations of temperature, whilst the lymphatics are stimulated. The gentle pressure is productive of good, and aids absorption.

Burgundy pitch has been supposed to exert some special action upon the rectum, and has been employed, made into pills with the following liquid, as a remedy for *hæmorrhoids*.

Pix Liquida—Wood tar contains amongst its numerous and complex constituents some creasote and turpentine, upon which many of its properties depend. It is thus antiseptic and stimulating, and possesses considerable power in checking profuse bronchial secretion; it is also diuretic. But, since the improved methods of preparing carbolic acid have been extensively employed, tar as a remedial agent has fallen into comparative disuse. There are, however, virtues possessed by tar which are not equally enjoyed by its more fashionable rivals: for example, as an expectorant tar is decidedly superior to any compound which can be distilled from it. It probably exerts its beneficial tonic effects upon the bronchial mucous membrane in the act of its elimination. The clinical observations of Burney Yeo, which have thrown much light upon the action of expectorant remedies, show that tar possesses most valuable expectorant qualities either when swallowed, inhaled as spray, or used as a fumigation.

The experiments of Ringer on the administration of tar to patients with *winter-cough* show that this remedy has the power of diminishing the danger of "catching cold."

Tar possesses very decided advantages over creasote and carbolic acid in the treatment of *chronic scaly skin affections*. It is a powerful stimulant when applied to a healthy sensitive skin, and often causes considerable inflammation and pain. In *psoriasis* the ointment of tar sometimes speedily effects a cure; and in *chronic eczema*, with painful itching, it occasionally will be found to relieve the itching, and. at the same time, remove the disease which causes it.

The internal administration of tar in 5 or 8 minim doses, gradually increased to 15 minims, in pills or capsules, is employed by Anderson in *chronic eczema*.

Tar water is made by adding 1 part of tar to 10 of water, and, after agitation and subsequent rest, on being poured off it makes a good stimulating lotion for *wounds* and *sluggish ulcers*. As a means of administering the remedy, it may be taken in wine-glassful doses.

(For Hæmorrhoids.)

℞. Picis Liquidæ gr. iiss.
Pulv. Acaciæ gr. iiss. misce.

Fiat pil. mitte xxxvi. et. iii. ter in die.

Plumbum—All the salts of lead are more or less poisonous, and when administered for a time give rise to definite and easily-recognised symptoms. There is loss of appetite, wasting, pallor, and constipation, followed by slowing of the pulse and heart's action, with violent colicky pains, cramps in the flexor muscles, and evidence of muscular impairment, as seen in paralysis of the extensors of the forearm, causing drop-wrist; occasionally headache, stupor, and convulsions are observed.

Lead becomes fixed in all the tissues, chiefly in the central nervous system, and is deposited in the affected muscles. These at first present no sign of change on the application of electricity; but as the paralysis lasts the current seems to have less and less effect, till finally it does not cause any contraction, and the muscular fibres become the seat of fatty degeneration, and finally may lose all traces of striation. The change probably is of spinal origin, since it occurs in groups of muscles which act together. Other groups may by the seat of paralysis besides those of the forearm and hand: the deltoid and the laryngeal muscles are occasionally affected, and paraplegic and even hemiplegic symptoms may show them-

selves, and finally the lead deposited in the brain may cause delirium, convulsions, and coma.

The joints get stiff and very painful, probably owing to a urate of sodium deposit, similar to that seen in gout; for lead prevents the excretion of urates by hindering the decomposition of uric acid. The structure of the liver and kidneys becomes affected, causing slight jaundice and albuminuria. The urine, at first scanty, becomes abundant and clear. It has been recently shown that the red blood discs are destroyed. A blue line appears along the gums, near to the teeth, after lead in small quantities has found its way into the system for any considerable time. It is caused by the metal deposited in the tissue of the gums being converted into a sulphide by the action of sulphuretted hydrogen generated from decomposition of fragments of food remaining between the teeth. It is best marked over the region of the incisors, and is absent or indistinct where the teeth are away.

The walls of the arteries contract, the blood pressure rises, the pulse slows, and becomes tense and full. The nervous system is seriously affected by lead, the changes in the sensory nerves giving rise to various neuralgic symptoms throughout the body; thus, gastralgia and sciatica may give trouble, sensibility to touch becomes diminished, and especially about the upper part of the body may this be noticed. The optic nerve occasionally suffers, producing amaurosis.

Harley considers that all the effects of lead upon the system may be traced to the enfeeblement of the nerve currents from impairment of the isolating power of the nerve fibres. The presence of lead in the tissues, by increasing their conducting power, tends to cause a lateral diversion of the nerve force, and thus exhausts the currents in their to-and-fro passage.

Abortion often results from lead poisoning, either on account of the toxic power of the drug on the fœtus or from its influence over the muscular tissue of the uterus.

Lead is eliminated by the urine, bile, mucus of the intestines and skin.

As the different salts of lead have slightly different actions upon disease, they may be referred to, under their different names.

Metallic Lead is inert in the system till converted into a soluble salt by acids, as those of the stomach.

Acetate of Lead is a valuable astringent. It combines directly with albumen, forming albuminate of lead, and when a strong solution is applied to a fresh wound or sore a film of this substance imperfectly glazes it over. It causes contraction of the vessels when applied in weaker solution; thus,

it directly diminishes the blood supply, and checks excessive secretion in *ulcers, wounds*, and most *local cutaneous inflammations*. *Itching* is often relieved in this way, and a weak solution (5 grs. to 1 oz.) makes a good injection in *gonorrhœa* and *gleet*. It is in the painful, red, and inflamed stage of *eczema*, characterized by much serous discharge or weeping, that lotions of lead give relief by constringing the small vessels, diminishing pain, itching, and discharge.

Lead Collyria should not be used in ulceration of the cornea on account of the danger of their forming opaque deposits in the tissue, interfering with sight.

Internally, the acetate finds its way into the blood, probably as an albuminate, and by its astringent effect upon the smaller vessels it diminishes the secretion of the bronchial tube, stops *hæmorrhages*, as in *hæmoptysis*, and controls *diarrhœas*. 2 to 5 grs. may be given every two or three hours in these affections, and there is little danger of lead poisoning ensuing, even though its use may be protracted.

(For Active Hæmorrhage.)

℞. Plumbi Acetatis gr.xxxij.
Liq. Morphinæ Acet. ʒiss.
Acidi Acetici Diluti ʒj.
Aq. Destillat. ad ℥viij. misce.

Fiat mist. sumat cochlearia ii. ampl. secundis horis.

(For the Diarrhœa and Sweating of Phthisis.)

℞. Plumbi Acetatis gr. xxxvj.
Ext. Opii gr.iv.
Pulv. Opii gr.iv. misce.

Fiat massula, et divide in pilulas xii., e quibus una tertiis horis sumatur.

The Sub-Acetate Solutions of Lead act like the acetate, and are generally confined to external application, where their unirritating astringent action renders them invaluable in *local cutaneous* or *superficial inflammations.*

℞. Liq. Plumbi Subacet. ℥ss.
Acid. Acetic. Dil. ℥j.
Spirit. Vini Rectif. ℥iss.
Aquae Rosae ad ℥xij. misce.
Fiat lotio.

A valuable astringent application to *sprains*, &c.

Carbonate of Lead is only used externally as a sedative and astringent application to excoriated or inflamed surfaces. either in the form of ointment or in fine powder dusted over the affected spot, and white paint speedily relieves the pain of *burns.*

The *Oxide* possesses similar desiccant properties, but is seldom used.

Nitrate of Lead has been successsfully employed by Sir Wm. MacCormae as an astringent in *onychia* and inflamed conditions of the nail. It makes an elegant astringent application, dusted in very fine powder over *cracked nipples*, and excoriations about the *mouth* or *anus.*

Iodide of Lead combines the alterative qualities of iodine with the astringent properties of lead. It is supposed to have a beneficial action in *scrofula*, but is seldom given internally.

Externally, it is used in the form of a plaster and ointment. The plaster can only feebly produce any alterative action independent of the good effects of pressure, and of the covering up and protecting of the part from changes of temperature. (See below.) The ointment can scarcely be said to be more active. as there is no evidence of its entering the system through the unbroken cuticle, though recently it has been recommended as an application to the breast to check the secretion of milk.

In cases of *herpes circinatus*, which are produced by the direct contagion from the cow, and which prove so very difficult to treat in the human subject, the iodide of lead ointment is a most efficient remedy, and, though not so certain as the corresponding salt of sulphur, it is much less irritating, and, consequently, may be applied more frequently to irritable skins.

The various plasters containing lead most probably act

entirely independent of their metallic constituent, which is not absorbed in this form into the system. The 11 preparations of which lead plaster forms the basis (except mercurial plaster) act mechanically, as before explained, by causing such pressure when properly applied as will alter the circulation, and, acting as a stimulus to the lymphatics, will assist the removal of effused products or *indolent enlargements*. By covering up the affected or diseased parts, they protect them from all sources of external irritation, especially from changes of temperature, and promote a more rapid interchange between the blood and the tissues, hastening repair, and at the same time, in the case of *diseased joints*, securing some degree of rest. It will be seen that the superficial spot so treated is placed upon the same favourable conditions as a deeper part.

In chronic lead poisoning, iodide of potassium is used to dissolve out the almost insoluble metallic compounds lodged in the nerves, viscera, muscles, and brain, but its administration must be backed up with purgatives, especially saline sulphates. Sulphur baths may be employed, and the tone of the affected muscles must be kept up by friction and the free use of the slowly-interrupted current. Alum has also been used with success, and belladonna is very useful in lead colic and paralysis.

As a prophylactic treatment to those much exposed to the fumes or dust of the lead compounds, lemonade made with sulphuric acid, instead of citric or tartaric, has proved beneficial; and a diet largely composed of milk has the power of preventing the poison affecting the system. Scrupulous personal cleanliness in those working with the pigments of lead is a very important point.

Podophyllum root and resin are active cathartics. The latter is the form in which the substance is generally administered. It is an irritant when applied to the surface of the body; and the dust produced by powdering it, coming in contact with the skin causes sores, and keeps the eyes in a state of chronic irritation. When given internally, the tongue and throat become inflamed in the same way, if the remedy is allowed to remain in contact with these parts for any length of time; but as ordinarily given, in the form of pill or even diluted tincture, this effect is not noticed.

It produces free purgation, with watery stools, by irritating the mucous membrane and acting as a powerful stimulant to the intestinal glands, whose secretion it greatly increases. The most of its force is spent upon the duodenum, whose contents it sweeps rapidly down the tube, resembling in this respect calomel; and hence the name frequently given to it

of "vegetable calomel." The resemblance ends here, for podophyllin does not possess any of the *alterative* properties of calomel, as abundant clinical experience proves. It has been demonstrated that podophyllin will purge when injected into the veins, cellular tissue, or serous cavities, and purging has been noticed to follow the application of this substance to an ulcerated surface.

In its action podophyllin closely resembles jalap, only ordinary purgative doses ($\frac{1}{6}$ to $\frac{1}{2}$ gr.) are more tardy in producing their effects, and are much more variable in their results upon different individuals. Sometimes $\frac{1}{4}$ gr. of the resin purges in a few hours, while $\frac{1}{2}$ gr. in another individual will not operate for 10 or 14 hours, and in a third may produce no purgation at all. Florid individuals, or those with much red pigment in their hair, may be often noticed to be very susceptible to the action of this drug. Often great pain results from the administration of podophyllin, especially from impure samples of the resin; common salt increases its cathartic properties.

Next to its action upon the duodenum and intestinal glands, podophyllin has been proved by Rutherford to cause very decided stimulation of the liver, and produces marked increase in the amount of bile secreted. The bile is its proper solvent, but if a large dose of the drug be given the hepatic secretion in which it is dissolved is not absorbed, but is swept along the intestines, and the liver is less stimulated than if only moderate quantities had been administered. It has been found, as the result of experiment, that in doses sufficient to cause severe purgation the biliary secretion is decidedly diminished.

These effects upon the liver and intestines give podophyllin a high place in the treatment of various diseases of the *liver* and *bowel;* thus for passive congestion or *hepatic torpidity*, or *obstinate constipation*, $\frac{1}{4}$ gr. of the resin will be found a valuable remedy, relieving the portal circulation speedily. The danger of griping will be removed by the addition of extract of belladonna or hyoscyamus; but, as a rule, it will be found advisable, when the purgative effects of podophyllin are required, to order it with some good cathartic pill, as aloes or colocynth, by which means its action is much more certain and uniform. Wood, however, believes that owing to the tardiness of its operation it should not be combined with speedy cathartics. He advises its combination with calomel, which takes about the same time to act. This must be also advantageous from another point of view, because calomel and podophyllin act upon the same portion of the small intestine, and must consequently intensify each other's effects.

By such a combination of purgatives as colocynth, podophyllin, jalap, and aloes, we get a more valuable hepatic stimulant than if any one be ordered singly in a larger dose. By this means we also ensure an action possessed by no solitary drug, since the entire intestinal tract from the stomach to the anus is equally stimulated.

℞. Extracti Hyoscyami gr.ij.
Resinae Podophylli gr.¼.
Extract. Colocy. Co. gr.iij. misce.

Fiat pil. mitte tales xii., i. pro re nata, hora somni.

Or,

℞. Resinae Podophylli gr.ij.
Extracti Belladonnae gr.ij.
Pil. Rhei Co. gr.xxx. misce.

Fiat massula, divide in pilulas vii quibus sumatur una tertia quaque nocte.

Potassium.—The salts of potassium vary so much in their therapeutic action that a brief account of each separately will be necessary. They possess some properties in common; thus, all act in *large* doses as powerful poisons independent of the acid with which they may be chemically combined. The spinal cord and nerve centres are paralysed; the heart is depressed, and its movements rendered slow and irregular, and there is a fall of temperature and blood pressure.

One large dose of any potassium salt injected into the veins of an animal causes sudden arrest of the heart's action and death. The experiments of Ringer show that probably the potassium salts act as pure protoplasmic poisons, destroying all nitrogenous tissues, the more highly organised nerve centres suffering first.

After a time the blood becomes thin and poor when the administration is protracted, and there is generally great loss

of weight from absorption of the fat deposited throughout the body, the digestive organs are interfered with, and large doses cause paralysis of the muscular coat of the stomach and intestines. In small doses these salts are restorative, supplying the place of those used up in the blood corpuscles and in muscle. Potassium salts exist normally in the *solid* tissues, whilst sodium salts abound in the fluids of the body. Most of them are diuretic and slightly purgative. The salts of potassium possess higher diffusive power and more readily enter the blood than the sodium salts. They increase the formation of *bile*. There are, in many points, close resemblances between the potassium and sodium salts, and they may be taken as the representatives of a very important chemical class of therapeutic agents—the alkalies. (See under Sodium).

Brunton has shown that the alkalies when admitted to the stomach act as direct stimulants, and notably increase the quantity of gastric juice when given before food; and thus their utility in *atonic dyspepsia*, and their power for harm in irritative gastric complaints with excessive acid secretion. Ringer's law in reference to acids holds true conversely when applied to alkalies, which he believes check all alkaline secretions, while they stimulate all secretions of an acid reaction.

Potassa Caustica.—From its affinity for water, and its power of dissolving albumen, this substance when applied to the tissues causes their rapid destruction, producing an extensive eschar. Its destructive action being both deep and wide, its use must be restricted to such parts where no vital organs or structures are within reach. Its deliquescent properties cause it to run over the skin if allowed to remain in contact with it long; hence it is desirable to circumscribe its action with a ring of adhesive plaster, or with some adhesive cerate of firm consistence, or combine it with lime.

When the solid stick is applied to the skin for the destruction of any very superficial part, a contact of short duration will suffice, and blotting-paper should be applied to absorb the moisture, else the eschar will be much deeper than is intended. *Cancers* of *epithelial* origin may be often satisfactorily treated in this way. It was the manner in which the old-fashioned issues were established, and is still employed in opening some *abscesses* or *cysts* in the interior of the abdomen, or in the substance of the liver. A series of mild applications of the caustic excites such inflammation that the abscess or cyst wall becomes glued to the abdominal parietes, when it may be opened with the knife or with further applications of the caustic without any danger of the contents escap-

ing into the peritoneal cavity. *Unhealthy, foul ulcers* showing a tendency to spread by sloughing may be destroyed with caustic potash, and its efficacy in various chronic indurated conditions of the *os uteri* is highly spoken of. In these cases the good effects are not so much owing to the destruction of diseased tissue as to the alteration in the diseased action which always follows the free use of the caustic. The caustic, apparently, acts as a powerful stimulant to the healthy tissues, hastening repair and growth, and substituting a healthy inflammation for some abnormal tissue change.

The deliquescent properties and severity of action peculiar to caustic potash are corrected by mixing it with rather more than its own weight of water, and making it into a paste as required, with rectified spirit of wine. In this form it is known as Vienna paste—a safer, milder, and more manageable remedy than the pure caustic potash. Internally, this substance is never given in the solid state, since small quantities would act like the powerful corrosive poisons, and cause death by destroying the mucous membrane of the stomach and gullet, somewhat after the manner of the strong mineral acids.

Liquor Potassæ is the form in which caustic potash is administered internally, though if given in its undiluted strength it is a powerful corrosive poison. Applied to the cuticle it dissolves it, and is used as a remedy for *in-growing toe nail*, with a view of softening the nail and facilitating its removal. As a lotion it is likewise useful in *skin affections*, where it may be employed with two distinct intentions, either to partially dissolve or hasten the removal of scales, as in *psoriasis*, or to allay the itching (by its alkaline property) of various conditions, *eczema*, *urticaria*, &c.

Internally, when Liquor Potassæ or any solution of the hydrate (largely diluted) is swallowed it readily finds its entrance into the blood on account of its easy diffusibility, but it first neutralises any free acid with which it comes in contact in the stomach; it acts thus as an antacid, either locally or after its admission into the blood.

Hence it has been used to check excessive acidity anywhere, as in *irritative dyspepsia*, or acid conditions of the urine, leading to uric acid deposits; but if given in doses sufficient to produce this remote antacid effect it will be often found to irritate the stomach, and, consequently, it is not so valuable as the less irritating salts. It increases and liquefies the secretion in *bronchitis*, and has been given in the various forms of *rheumatism* and *gout*. It is diuretic to some extent, as it passes out by the kidneys, but it possesses less power (in safe doses) over the state of the urine than the citrates and car-

bonates. Liquor Potassæ does, however, cause an increase in the nitrogenous elements of the urine, possibly by encouraging the various tissue changes or destructive metamorphoses throughout the body, and not by any mere diuretic action of the drug. It has been used in *obesity*.

The liquor appears to possess special sedative influence over the *bladder* and *urethra*, and its use in various irritable conditions of these parts, caused by unhealthy urine passing over them, is more liable to be followed by good results than if any of its salts had been given, the bicarbonate excepted.

Small doses, given with a vegetable tonic before meals, possess considerable power in increasing the flow of the gastric juice by acting as a direct stimulant to the mucous membrane, in the same way that acids given before meals correct or prevent the excessive secretion of acid juice.

(In Atonic Dyspepsia.)

℞ Liquor. Potassae m.lxxx.
Infus. Calumbae ℥viiss.
Tinct. Aurantii ℥ss. misce.

Fiat mistura, cujus capiat cochleare amplum ter in die ex aqua ante cibos.

Potassa Sulphurata possesses the properties of the sulphur compounds in a more marked degree than those of the potassium salts, and will be referred to under Sulphur.

Potassii Acetas, Citras, and Tartras—These salts, in moderate doses (about 30 grs.) enter the blood speedily. They circulate along with it, acting as restoratives to the corpuscular elements and muscles and the various tissues containing potassium salts; reaching the kidneys the excess is exerted in the urine. Before passing out of the body the salts of potassium with vegetable acids, are converted into carbonates or bicarbonates, increasing the alkalinity of the blood and rendering alkaline the acid urine. The alkalinity of the urine results even if the salts contain an excess of acid, and occurs, though slightly, after the use of the acid tartrate: and since they possess no local corrosive action, but may be taken in doses ten to twenty times larger than is necessary to produce their diuretic effect, they may be administered freely, and for a long time if necessary. Though the reaction of the urine is

thus altered from acid to alkaline, still the *total* quantity of acids in a state of combination secreted by the kidney may be augmented.

In this way the urine may be kept alkaline for many weeks, and there is some evidence that during that time small uric acid stones in the kidney may be dissolved or so reduced in size that they may pass down the ureter and be expelled through the urethra. In health they often fail to increase the amount of urine.

In large doses, the tartrate, citrate, and acetate of potassium act as purgatives, from ¼ to ½ oz. in solution being generally enough to cause mild catharsis. The skin is acted upon by small doses, and this affords a *possible* explanation of the refrigerant or febrifuge qualities which these salts are supposed to possess. They open up the cutaneous circulation by causing dilatation of the superficial capillaries, and the resulting perspiration offers one way for the extraction of heat from the body. It is, however, probable that at the same time they cause such alterations, either in the density or composition of the blood, as prevent or retard the changes taking place in that fluid upon which the increased temperature of the body may depend.

In *acute rheumatism* these salts are found beneficial; by increasing the alkalinity of the blood they counteract the effects of the rheumatic poison, and thus reduce the body heat and assist in the cure of the disease. Their antacid properties do not, however, account for all the good they do in acute rheumatism, for they probably exercise a *sedative* influence over the nervous system, though it is by no means clear that they materially shorten the length of the attack. (See Potassii Bicarbonas.) Recently, as good results appear to have been obtained by the purely acid (acetic) treatment of this disease.

The *acetate* of potassium is the most certain diuretic of the vegetable potassium salts; the *citrate* is the most reliable diaphoretic; whilst the *acid tartrate* possesses the most pronounced cathartic properties. The citrate is more commonly ordered than any other potassium compound, since it is this salt which is formed when the carbonate or bicarbonate is administered in effervescence with lemon juice. In this form the citrate is an elegant gastric sedative, and it is beneficial in irritable conditions of this organ; with the addition of a little morphine no combination gives such relief in *phthisis* when the skin is hot and dry, the cough harassing, and the tongue furred. The good effect in such cases is to some extent owing to the carbonic acid gas coming in contact with the peripheral nerves of the irritated mucous membrane. These salts of potassium (especially the citrate) have been highly recom-

mended as restoratives in *scurvy* by those who believe that the disease is caused by a deficiency of potassium in the system.

It is the *citrate* which should always be selected when we wish to act upon the urine and keep it alkaline for any considerable length of time, because this salt has the slightest destructive action upon the blood and is the least likely to derange the digestion by its prolonged administration.

℞. Potassii Acetatis ʒiss.
Liq. Ammon. Acet. ʒij.
Syrupi Aurantii ʒss.
Aq. Camphorae ad ʒviij.

Fiat mistura, cujus capiat cochlearia duo ampla quartis horis.

℞. Potassii Citratis ʒss.
Syr. Flor. Aurant. ʒiv.
Spt. Ether Nit. ʒiv.
Aquae ʒvij. misce.

Fiat mistura, sumat coch. amplum tertiis horis.

The *acid tartrate* may be given with sliced lemon in hot water, sweetened with a little sugar. Its purgative power is increased if it be administered in less water than will dissolve it; and there are few more agreeable laxatives than a paste made of cream of tartar and orange marmalade. The mildness of its operation recommends its use in the reflex constipation caused by painful *hæmorrhoids*, in which case it may be combined with sulphur, as in the official confection, or it may be given with marmalade.

℞. Potassii Bitart. ʒj.
Conserv. Aurantii (Keiller) ʒiv.
Sulphuris ʒss. misce.

Fiat electuarium, cujus capiat cochleare magnum omni mane nocteque.

Potassii Carbonas.—There is little difference in the action of the carbonate of potassium and the liquor potassæ. It is corrosive to some extent, and a large dose causes death by destroying the tissues with which it comes in contact, though its effects are not so severe as are those following caustic potash or the liquor. It is seldom given in medicine, the bicarbonate possessing all its virtues without its irritative qualities. It readily enters the blood, in which it remains as carbonate; and it passes through the body, being eliminated unaltered, and appearing as carbonate in the urine, which it renders alkaline. It is diuretic, antacid, and antilithic.

Externally (4 grs. to 1 oz.), it often gives good results by checking the acrid secretion of *weeping eczemas* and the *itching of urticaria* and other skin affections.

Potassii Bicarbonas.—This salt possesses all the virtues of the potassium compounds, without any local corrosive or irritative action. It is a mild antacid; given in small doses, it stimulates the secretion of the gastric juice before taking food, and thus is beneficial in *atonic dyspepsia*. In *painful gastric affections* accompanied by excessive secretion of acid and acrid fluid after meals, if administered in large doses it counteracts acidity, and often gives instant relief, though its continued administration in such cases is not productive of permanent benefit. In cases of simple *gastralgia* or *cardialgia* not evidently depending upon excess of acid secretion, the bicarbonate often gives relief by its local soothing or sedative action, possibly by giving off carbonic acid gas as it comes in contact with acids.

It makes the blood more alkaline, and is excreted as carbonate by the kidneys, which it stimulates. Passing over the mucous membrane of the genito-urinary tract, it either exercises its direct sedative influence, or else, by rendering the urine less irritating, it soothes the inflamed surfaces in *cystitis*, *gonorrhœa*, *pyelitis*, &c. It may well be combined in such cases with buchu, pareira, or hyoscyamus. If the urine be already alkaline and decomposing, causing irritation by the rapid formation of ammoniacal compounds in the bladder the potassium salts may do harm if persisted in. If the irritation is caused by the presence of an abnormal amount of uric acid, then the carbonate or bicarbonate gives speedy relief.

There is some evidence to show that good results may be obtained by the injection into the bladder of alkaline solutions with the intention of dissolving small *uric acid calculi*.

There is much difference of opinion about the usefulness of the alkaline treatment in *acute rheumatism*; but though it may be considered that evidence is wanting to prove that this

treatment possesses the power of cutting short the disease, still it is a well-recognised fact that the alkalies afford marked relief in this affection, and the danger of cardiac complication is lessened. It is possible that the beneficial effects of the drug do not depend upon its neutralising the supposed excess of acid in acute rheumatism, but from its so altering the composition of the blood that the changes in this fluid, caused by the rheumatic poison, are less easily effected.

In *rheumatoid arthritis* and *chronic rheumatism* good results are found from the free administration of the bicarbonate if combined with the iodide of potassium.

It should be remembered that the alkalies, when given for a long time in medicinal doses, cause deterioration in the quality of the blood and diminish the weight of the body; and thus a tardy convalescence may result after the disease for which they are administered is cured.

The best form in which to give the bicarbonate of potassium is effervescing with lemon juice, one tablespoonful of which will be found to neutralise 25-30 grs. of this salt; but the alkali may be in any excess that the physician considers his case demands. Thus, in *acute rheumatism* we may order:—

℞. Potassii Bicarbonatis ʒxij.
Aquae Destillatae ʒxij. misce.

Fiat mist. cujus capiat cochlearia duo ampla tertiis horis in effervescentia cum succi limonis recentis cochleare amplo.

A solution of citric acid may be used as a substitute for fresh lemon juice when the fruit cannot be obtained, but the natural juice is always to be preferred.

The official effervescing solution may be freely given with milk, and is often retained by the stomach when other foods are rejected.

Potassii Bichromas is introduced into the Pharmacopœia to make chromic acid and valerianate of sodium, and it formerly was used for its supposed alterative action in *syphilis*, resembling mercury in therapeutic effects, but it is seldom, if ever, now prescribed. Occasionally it is employed as a caustic in the form of a saturated solution, brushed over *superficial*

growths, especially of a syphilitic character. $\frac{1}{6}$ gr. would be an average dose of this drug; two or three grains will act as an emetic. Recently Richardson has again drawn attention to a peculiar ulceration of the hands, face, and septum nasi which attacks persons working with this drug. The ulceration does not come on unless there has been a previous abrasion.

Potassii Bromidum and Iodidum. (See under Bromum and Iodum.)

Potassii Chloras—Few remedies have been credited with so many virtues, but since the knowledge that chlorate of potassium passes for the most part through the system unchanged without parting with its oxygen, its uses have been somewhat restricted; and some authorities have been led erroneously to state that it produces no appreciable effect in the system after its admission into the blood.

Recently Mering, in Hoppe-Seyler's laboratory, has demonstrated that "this salt under the influence of carbonic and probably other acids, is decomposed in the system with the gradual liberation of chloric acid, which tends to reduce the alkalinity of the blood, and in this lies the key to the right understanding of the action of chlorate of potassium."

In moderately large doses (20 grs.) it stimulates the kidneys as it is excreted by them, and a portion appears in the urine. This effect will be found to be perhaps more constant than that of most other diuretic medicines; and it seems to act powerfully upon the kidneys if administered during pregnancy. In poisonous doses (1 oz.) it causes active congestion of these organs, with bloody and finally suppressed urine.

It is, however, for its influence over *unhealthy mucous surfaces* that this remedy will always keep a high place in therapeutics. This effect is witnessed when a solution is applied to the *spongy gums* in various *aphthous conditions* of the mouth and throat, and in active *inflammations* of the *tonsils* and mucous lining of the *pharynx* and *nares*. A rational explanation of its action in these cases has yet to be given, and we must fall back upon such a term as "alterative" to explain its beneficial effects, for it seems by its local influence to alter in some way the unhealthy action of the membrane. One effect may be constantly observed when chlorate of potassium is used as a gargle in *follicular pharyngitis* or *acute tonsillitis*. Marked benefit at first follows its use, but if it is persevered in for any length of time, it keeps up a chronic irritation, which subsides only after its use is withdrawn. It appears to have an influence over the salivary and buccal glands, like what it has been observed to exercise over the mammary—viz., it

cheeks or moderates their secretion if excessive, and stimulates or increases it if scanty. It has been highly spoken of in excessive salivation from the injurious use of *mercury*.

After its absorption and entrance into the blood it appears to exercise the same alterative, stimulating, or regulating power over other mucous surfaces, especially the intestinal. In diseases of *childhood*, depending upon *catarrhal* and other *unhealthy inflammations* of the *mucous membrane* of the *alimentary canal*, from the mouth to the anus, the writer has found this drug invaluable. It is an expectorant in *bronchitis*.

In *scrofula* and various states depending upon a depraved or impoverished condition of the blood, chlorate of potassium has been highly spoken of, though it appears possible that many of its good effects in these cases may depend upon the iron which is so constantly prescribed along with it.

A solution of about 6 grs. to each fluid ounce of distilled water is a satisfactory application to *unhealthy sores and ulcers*, and may be used for washing out foul *sinuses* or *cavities*, and will be found a valuable stimulant in various chronic affections of the *bladder*, if injected twice a day. The powdered salt may be applied to *aphthous* spots on the *cheeks*, *tongue*, or *gums*, and has been found to alter the action, diminish the pain, and check the growth of *epithelial cancers*. Small pieces sucked in the mouth, by reflex action excite effectually the secretion of healthy mucus in chronic *bronchial* and *laryngeal affections*, so that the expectoration is rendered more fluid or less adhesive, and is readily swept up by the cilia; hence this salt is classed as a ciliary excitant.

Internally, it acts often beneficially as an expectorant in *chronic bronchitis*, when given with hippo and senega.

Dr. Harkin has pointed out its usefulness in *purpura hæmorrhagica*, *hæmaturia*, and a host of blood ailments.

Recent experience is showing that chlorate of potassium is not so inert as has been supposed; already many cases of poisoning having occurred on the Continent, and some from taking doses under 1 oz.; and Professor Bohn suggests the possibility of the chlorate being the cause of death in some diseases in which it is administered as a remedy, and he gives two instances of death in diphtheria, closely resembling chlorate of potassium poisoning, the salt having been previously freely given.

In acute poisoning, death may take place in a few hours, from the hæmoglobin of the blood being converted into methæmoglobin, producing a chocolate colouration; there is vomiting, diarrhœa, dyspnœa, and cardiac depression.

(Gargle.)

℞. Potassii Chloratis ʒiss.
Aquae Rosae ʒij.
Aquae ʒviij. misce.

Fiat gargarisma, saepe utendum.

(Mixture.)

℞. Potassii Chloratis ʒj.
Tincturae Ferri Perchlor. ʒss.
Glycerini ʒiss.
Aquae Destill. ʒxviij. misce.

Fiat mistura, cujus cpt. cochlearia duo ampla ter quotidie ex cyatho aquae

Potassii Cyanidum.—This active poison is only introduced into the new B.P. for its employment in the purification of bismuth. It is not used internally; it resembles hydrocyanic acid in its action upon the system.

Potassii Nitras—The salts of potassium, with the mineral acids, differ materially from the vegetable acid salts of potassium in passing through the system and being eliminated unchanged in the urine, while the latter are converted into carbonates.

The nitrate is a very active substance; it rapidly enters the blood, and in large doses prevents its coagulability by its action on the fibrine. It so alters the red blood corpuscles that they soon cease to possess any power of carrying oxygen to the tissues. The first effect upon the heart is to render it slower in its movements; afterwards it becomes quick and weak and finally stops. Death may result from the violent irritant action of the salt on the alimentary canal giving rise to severe vomiting and purging.

The salt is eliminated by the kidneys, during its passage through which it acts as a stimulating diuretic, appearing in the urine as nitrate. The skin is acted upon, this salt possess-

ing very constant diaphoretic powers, which are increased if it be administered in some hot fluid at bed-time. A glass of whiskey or brandy, with boiling water and sugar and half a dram of nitrate, affords a good chance of getting the hot skin to secrete abundant moisture in *febrile affections*, while it slightly reduces the pulse, and the temperature falls a little.

This refrigerant action of nitre is generally explained by its sedative influence on the circulation and its effect upon the skin. It is a favourite diaphoretic and diuretic in all *inflammatory affections*, except where the gastro-intestinal or renal apparatus is involved. It is, probably, partially excreted by the bronchial mucous membrane, over which it appears to exercise an influence not unlike that which it effects on the skin, and it is a reliable expectorant. It appears to be most useful when the irritation or inflammation is confined to the *trachea* or *larger divisions* of the *respiratory tract*. Bibulous paper soaked in a strong solution of nitre, dried, and allowed to burn slowly in the patient's room, has long been a favourite remedy in *asthma*.

The nitrate may be given with great advantage in a mixture of the citrate or bicarbonate in effervescence.

℞. Potassii Bicarbonatis ʒv.
Potassii Nitratis ʒij.
Aquae Destillatae ʒxij. misce.

Fiat mistura, capiat ʒi. cum ʒss. succ. limonis tertiis horis.

Potassii Permanganas is a powerful oxidiser, readily parting with its oxygen, which, on being freed, forms harmless compounds with foul-smelling gases and liquids, thus acting as a very efficient deodoriser. In a similar way it destroys the germs of disease, and thus is a disinfectant. It makes an elegant and not unpleasant gargle in fetid *ulcerations* about the *gums*, *mouth*, or *throat*, in the proportion of about 2 grs. of the salt in 10 oz. of distilled water. This weak solution may be also used as a lotion to *suppurating sores*, or as an injection into suppurating *cavities* and *sinuses*, as in *ozæna* and *empyema*, or as an injection in *cancer* of the *os uteri*. It should never be ordered in company with any other drug, but be prescribed with distilled water, and kept in stoppered bottles; or given in the form of pill (page 54) as it so

readily parts with its oxygen, even exploding when mixed with sugar, syrup, or easily oxidised bodies. It is probably entirely decomposed in the stomach before absorption.

The writer has found better results from an injection of this salt (½ gr. to 1 oz.) in *gonorrhœa* than from any other local remedy. It is very valuable (1 gr. to 1 oz.) in *gleet*.

It has been given in grain doses in *diabetes*.

The permanganate of potassium has been very highly extolled as a specific in *amenorrhœa* or *scanty menstruation*, given in 2 gr. pills. The writer has not been fortunate with it in a number of such cases in which it was freely given about the time of the expected illness.

It has been used to counteract the poison of snake-bites, and Dr. M'Farland has recommended it strongly in *cholera*.

Potassii Prussias Flava is only employed to make hydrocyanic acid.

Potassii Sulphas is used in Pharmacy to assist in the subdivision of the particles of powders and pill masses to insure their uniform separation. It is a mild cathartic, acting by increasing the intestinal glandular secretion; and is especially suitable for children. The experiments of Rutherford prove that it is a decided hepatic stimulant, though uncertain.

It may be given in teaspoonful doses in a tumblerful of water.

Prunum.—The dried plum is seldom employed as a medicine, but it is freely used in domestic life as a food and sweetmeat. It possesses faint laxative properties, and when stewed makes a tempting dish for constipated children. It probably acts by increasing peristaltic action.

Pterocarpi Lignum has faint astringent properties, probably depending upon traces of tannic acid which it contains. It is used solely as a colouring agent; and in the compound tincture of lavender, to which it imparts its beautiful red colour, it is prescribed to render colourless or unsightly mixtures, more attractive.

Pyrethri Radix may be taken as the type of a class of remedies called sialagogues, which increase the quantity of the salivary secretion. When chewed in the mouth, pellitory acts as a powerful stimulant to these glands, causing a sudden increase in the quantity of saliva by its direct irritant action. It has been thus used to relieve the pain of *carious teeth*, and as a masticatory in *paralysis* of the *tongue* and relaxation of the *uvula*. Its pain-relieving properties are very uncertain, though the tingling and unpleasant sensation which it causes in the mouth will always to some extent mask pain; and it appears to blunt the sensibility of the nerves distributed to the

lining membrane of the mouth. Internally, it has been given in *globus hystericus* by Roth, who reports very favourably of it. He believes it acts by stimulating the sympathetic.

The writer has found it useful as a rapid method of *having iodine eliminated from the system in chronic poisoning.*

The tincture may be used as a *mouth-wash* in the proportion of a teaspoonful to a wine-glassful of water; or it may be applied in its undiluted state on cotton wool to the cavity of the diseased and painful tooth.

Pyroxylin is employed in making Collodion (which see). It is not used internally.

Quassia is a pure bitter tonic, devoid of astringency; it is used in *dyspepsia* and *anorexia.* Under "Calumba" its mode of action is explained. It closely resembles calumba, and, like it, may be given with the preparations of iron, since it contains no tannin.

It possesses toxic properties when eaten by flies and fish, and has been supposed to act in a similar way in various diseased conditions of the blood, destroying unhealthy organisms, and acting as a true febrifuge, like quinine, but only very doubtful success has resulted when thus administered, possibly because too small a dose has been used. When injected into the rectum a strong infusion will cause the death of the *thread worm.*

Recent attempts have been made by Adrian and Moreaux to isolate *quassiin.* They have been so successful as to lead to the hope that the pharmacology of this drug will soon advance.

℞. Infus. Quassiae ℥xj.
Tinct. Quassiae ℥vj.
Tr. Ferri Perchloridi ℥ij. misce.
Fiat mist. cujus capiat cochlearia duo ampla ter in die.

Quercus Cortex—Oak bark is a valuable astringent, owing to the amount of tannic acid which it contains—(see under Acid. Tannicum)—and it may be given internally wherever an astringent is indicated, though it is generally used as an external application. The decoction makes a useful though not very elegant *gargle* in *relaxed sore throat* and *spongy gums;* or a *lotion* to *flabby ulcers* and profusely *suppurating wounds;* or an *injection in gonorrhœa, leucorrhœa,* and *prolapsus ani.*

In passive *diarrhœa* half a wine-glassful may be taken after each loose motion.

℞. Alum. Sulph. ʒiij.
Decocti Quercus ℥xij. misce.
Capt. cochleare amplum ter in die.

Quinine. (See under Cinchona.)

Resina is not administered internally. It owes its position in medicine solely to its adhesive property and to its power of making various fatty mixtures of suitable consistence for ointments. It has, however, feeble stimulating qualities, and is much used when made into an ointment with wax, lard, and oil as a mild stimulant to *sluggish ulcers* and *slowly healing wounds;* it appears to act in such cases by causing enough irritation to slightly increase the blood supply; at the same time it protects the ulcerated or wounded surface from the action of the atmosphere.

Rhamni Frangulæ Cortex when freshly collected is a powerful irritant to the gastric and intestinal membrane, producing violent vomiting and purging, and may cause death. After being kept for a year or more its action is much milder, and it becomes a valuable cathartic, acting very much like its ally—Cascara Sagrada—which see. It is useful in *chronic constipation*, and as a mild purgative where *hæmorrhoids* are present. It may be used exactly as the Cascara, and its dose will not require to be increased as is the case with other purgatives. One dram of the liquid extract may be given twice a day. It is very suitable for children.

Rhamni Purshiani Cortex (or Cascara Sagrada Bark—which see, page 355).

Rhatania (or Krameria—which see, page 413).

Rhei Radix—Rhubarb when administered in small doses (2 to 5 grs.) acts as a stomachic, increasing the quantity of the gastric juice, improving the appetite, and assisting digestion, and the tincture has been long used as a tonic. It soon finds its way into the blood, and, acting as a stimulant to the liver, or to that portion of it whose duty it is to secrete bile, it increases the quantity of this fluid without diminishing any of its ingredients. The cholagogue action of rhubarb is independent of any cathartic effects, as the results of experiments

prove that the amount of the bile can be markedly increased in fasting animals without the bowels being disturbed.

In large doses (20 grs.) its cathartic properties are rendered apparent, and it produces mild purgation, probably by stimulating the muscular movements of the intestinal tube from the duodenum to the rectum. It also acts, though to a small extent, as a mild stimulant to the intestinal glands, and slightly increases their secretion. In doses of 60 grs. the intestinal fluids are considerably augmented.

Rhubarb after exercising its cathartic power becomes an astringent, and checks the alimentary secretions, causing subsequent constipation, owing to the rheo-tannic acid which it contains, and consequently it is not an advisable purgative for patients suffering under chronic constipation.

This renders it highly valuable in *diarrhœa* when we wish to produce an astringent effect after getting rid of some irritating food or matters remaining in the canal.

In *hæmorrhoids* few remedies will be found so useful as rhubarb, and some consider it much more efficacious if slowly chewed in the mouth; but in any case its great disadvantage is its astringency, which, in this affection, is entirely counteracted by two to four dram doses of olive oil taken every night, floating on a little milk.

The stools are at first rather dark, owing to the increased bile, and colouring matter of the rhubarb; they are afterwards found to be paler than natural. The colouring matter of the rhubarb, which consists of chrysophanic acid, is found in the perspiration, milk, and urine, but chiefly in the latter.

An equal quantity of bicarbonate of sodium is said to overcome the astringent properties of rhubarb and disguise its taste; and it may be so ordered as a powder in teaspoonful doses in water.

It should be ordered with some substance like magnesia, as in the celebrated Gregory's Powder or official Pulv. Rhei Co., which may be given in milk, and is an invaluable cathartic in the various *gastric* and *abdominal* troubles of *childhood*. The syrup is well suited for children, the coriander partially concealing the flavour,

The following form will be found a good one for producing the stomachic effects of rhubarb, though some prefer to substitute peppermint for the essence of aniseed; or the official compound powder may be given in a mixture—half an ounce rubbed up with nine and a half ounces of Aqua Menthæ Viridis and half an ounce of Spiritus Ammoniæ Aromaticus.

℞. Pulv. Rhei ʒiss.
Syrupi Simp. ʒj.
Spt. Chloroformi ʒiij.
Ess. Anisi m.xx.
Aquae Carui ʒviss. misce.
Fiat mistura. Signa, "A small tablespoonful as a tonic or stomachic or a wine-glassful as a purgative."

If a combination of rhubarb with an active cathartic is required, the official pill in 10 gr. doses will be found to answer all purposes. The extract, or the powder made into a pill with a little glycerine, is the best form in which to administer rhubarb when we wish to have its effects without the influence of any other drug.

Rhœados Petala possess very feeble narcotic qualities. Though it is impossible to get any traces of morphine when submitted to chemical examination, still the characteristic effects of opium have been noticed when the syrup has been given to very *young children* or *infants*. Nevertheless, it is only for its colouring properties that it can be said to be used in medicine.

Ricini Oleum is a mild cathartic, by some authorities classed as a laxative. If rubbed into the skin of the abdomen in presence of a heat above that of the body, or if injected into a vein, swallowed, or thrown into the rectum, castor oil produces the same effect upon the intestines. The intestinal glands are slightly stimulated, and the vermicular contractions are increased in frequency and power, especially in the duodenal part of the canal, the result of which is, that in about six hours several very soft but not watery stools are passed with little pain and no constitutional disturbance. The oil passes out by the bowel in a slightly altered condition, but it may be recognised in the secretion of the mammary gland by its purgative effects upon the infant.

It possesses no power over the hepatic secretion, and appears to lose its influence after a time; and in some cases its administration seems to be followed, like rhubarb, by an astringent effect. In *pregnancy*, where it is a very safe purgative, large

doses may be required if regularly and constantly employed; and it is strange that sometimes in these cases if the large dose (1 oz.) be withheld, and only one or two teaspoonfuls given, the drug appears to regain its power, and to purge freely. The oil greatly assists the nutritive process, and *increases markedly the weight of the body*, being in those cases where it is tolerated, capable of producing results like cod-liver oil.

Its bland qualities render it a favourite and safe purgative for *young children* and *infants*, and in cases of *pelvic disease*. In the *diarrhœa* of infancy it is a prized medicine, acting by causing the expulsion of all irritating matters.

In *fæcal accumulations* castor oil has long held a high reputation; but too great stress cannot be laid upon the rule, that it should not be depended upon without the aid of enemata of large quantities of warm water.

Accumulations of the rinds of fruits (especially of gooseberries), so often found in children, are not advantageously expelled by castor-oil, as is supposed. More energetic catharties are required, and calomel is especially useful in such cases. A drop of castor-oil allowed to fall upon the *conjunctiva* is a soothing protective when a foreign body has found its way under the lids.

The unpleasant flavour and sickening, greasy taste of castor-oil is a great hindrance to its use, and various methods have been resorted to by the physician, dispenser, and nurse to hide its nauseous qualities. If ordered alone, it may be administered when it reaches the sick chamber by floating it upon a little wine or spirit in a glass, without being permitted to stick to its sides. In whatever form administered, the patient should bolt it quickly; some patients take it in orange juice, coffee, water, or gruel.

Directions are frequently given to float the dose between different strata of liquids. This is not practicable. Perhaps the best of all methods is to pour some *thick* cream into a very clean wine-glass, turn it round, so that the sides get smeared well over, pour in a tablespoonful of castor oil, and a little cream on the top. The patient, having taken a teaspoonful of cream into his mouth and caused it to come in contact with his palate by the movement of his tongue, is directed to swallow at a gulp the oil and cream out of the wine-glass, throwing back his head, that they may the more readily pass over the tongue. If not taken in this way, castor-oil should be *gently* warmed before being administered, as it is rendered thus more liquid and less adhesive. The essential oil of bitter almonds conceals the nauseous smell of this oil. The attempts to prescribe this drug in the form of an *emulsion* are generally fail-

nres, and liquor potassæ should not be used. If a castor-oil draught is ordered by the physician, he should endeavour to make it of as small bulk as is possible.

A favourite combination is a half-ounce dose of castor oil with 10 to 20 minims of tincture of opium to prevent griping.

℞. Olei Ricini ℥iv.
Mucilaginis ℥iij.
Olei Limonis gt. ij.
Aquæ ℥iij. misce.
Fiat haustus.

Children bear large doses well, and a small teaspoonful is often administered to newly-born infants without producing unpleasant effects. As a rule, never more than half an ounce should be administered for the first time to an adult, and often two drams will be found enough.

One to two ounces, with as much mucilage of starch, may be injected into the rectum.

Rosæ Caninæ Fructus—in the form of confection—is used as a basis for pill masses and electuaries. It is useful for working up insoluble powders, especially of vegetable origin, into the pilular form. It possesses two disadvantages as an excipient—viz., the free malic acid which it contains is liable to decompose many metallic salts, and it generally increases the bulk of the pill to a very undesirable extent. It can scarcely be regarded as having any therapeutic properties.

Rosæ Centifoliæ Petala are only used in the form of otto, or rose water, for the sake of their delicious perfume. The water may be used as the basis of eye-washes and lotions, especially for the face, where its fragrance renders it particularly acceptable.

Rosæ Gallicæ Petala.—The petals of the red rose possess astringent properties if collected before their expansion, as the Pharmacopœia directs. Their astringency depends upon the small quantities of tannic and gallic acids contained in them, and is not so very decided as to warrant the use of the drug in the presence of so many valuable official tannates.

The infusion made with dilute sulphuric acid and water is an elegant method of administering the mineral acid, and may be made the basis of many agreeable mixtures. Its activity

depends upon the tonic and astringent properties of sulphuric acid, and it may be freely given where this acid is useful, as in the *hæmoptysis* and *sweating* of *phthisis*, and as a gargle in *relaxed sore throat*. The dilute nitric acid may be substituted for the sulphuric with great advantage in suitable cases, as pointed out by Squire.

The confection of the red rose is used like the corresponding preparation of hips—to form the basis of pill masses and cough tinctures. The syrup is never employed except for its colour.

Rosmarini Oleum is a powerful stimulant when taken internally (which is seldom); it acts like peppermint and cajuput.

Externally, it is a valuable rubefacient, and is much used as an application to the *scalp* in *baldness*, where it is commonly supposed to exercise good influence over the nutrition of the hair-bulbs, by increasing the supply of blood to the skin. Its efficacy is greatly increased by combining it with cantharides. It is often added to liniments on account of its odour.

The following is a valuable stimulant to the growth of hair :—

℞. Olei Rosmarini ℥iv.
Liq. Epispastici ℥ii.
Olei Amygdal. Dulc. ℥iss.
Spt. Camphorae ℥ii.
Glycerin. Boracis ℥j.
Otto de Rose gt. viij.
Tinct. Jaborandi ℥i. misce.

Signa. "A little to be rubbed into the roots of the hair every night."

Rutæ Oleum is a strong rubefacient, and if applied to the skin with friction it will often cause vesication.

Internally, rue is not often administered; it acts as a powerful stimulant like rosemary, peppermint, and cajuput, and is occasionally used for its antispasmodic powers to relieve *colic* in 2 to 5 minim doses on sugar, or in a spoonful of whiskey, or in pill. It may be given in *hysterical ailments*, *epilepsy*, &c.

Rue excites the contractions of the uterus, and has been

employed to *produce abortion*, and has caused death, preceded by symptoms of narcotic and irritant poisoning.

Sabadilla and Veratrine, its alkaloid, are violent irritant poisons, producing vomiting and purging, with intense abdominal pain, convulsions, extreme muscular prostration, and great cardiac weakness and collapse, with a prickling sensation felt in the skin of the body. It exerts its action chiefly upon the *muscles* by producing *prolonged contraction*, which Brunton has found is removed by extremes of heat and cold. The sensory and motor nerve endings, at first stimulated, become paralysed, and the heart muscle, after slow and prolonged contraction, is arrested in systole, the pulse and blood pressure having at first become increased, then fall markedly. The respirations, at first quickened by small doses, become slowed by large ones, and finally paralysis of both vagi and respiratory centre takes place.

Veratrine applied to the skin, paralyses the filaments of the sensory nerves, acting as a local anæsthetic, and hence has been used as an application in the form of the official ointment to various *neuralgic nerves*. The best results have followed its use in the case of the fifth nerve, and it has been found useful in *bad sciatica*, and *sick-headache*, when rubbed over the affected or tender nerves. Its use is generally followed by some local irritation in the skin. When it comes in contact with the nasal mucous membrane it acts as a sternutatory, causing depressing sneezing. It also acts as an errhine, greatly increasing the secretion of the nasal mucous membrane.

Veratrum viride, or green hellebore root, should not be confounded by the student with veratrine, the alkaloid of sabadilla, though sabadilla and green hellebore resemble each other very closely, and the alkaloids of each are identical.

Veratrine is only used externally; when its internal effect is required, the green hellebore root tincture is used. In large doses this acts as a powerful drastic purgative, causing watery, painful, and bloody motions, resembling colchicum in some of its effects, whilst its influence over the heart, which it at first stimulates and afterwards soothes, has been likened to that of aconite. The pupil dilates, and the pulse under its use may fall to half its number, and is very much weakened in force. The muscles, at first rendered more irritable, become greatly prostrated, and voluntary movement is difficult, evidently from the prolonged muscular contraction, and paralysis of the nerve endings. *Small* doses (3 minims of the tincture) appear to act like digitalis, by strengthening the contractions of the ventricle; and moderate doses (20 minims), in addition to reducing the pulse, cause nausea and often vomiting. The body heat in health

is scarcely affected; but in *febrile conditions* hellebore undoubtedly reduces the temperature, though not to the extent believed by some of its advocates. It has been used in the treatment of *fevers, acute rheumatism, gout, local inflammations, acute pleuritis*, &c.; but perhaps the most promising results have followed its use in *acute pneumonia, mania*, and *aneurism*. It should be administered in small doses (2 mins.) every hour, and its effects closely watched.

Its dangerous depressant effect on the heart, and its powerful irritant action on the alimentary canal, have prevented its use in this country.

Veratrine, green hellebore, and sabadilla may be employed in powder or ointment to cause the destruction of *pediculi*.

Sabinæ Cacumina—Savin is used externally as a rubefacient, and the oil, if applied for a sufficiently long time, will produce vesication. The official ointment is used as a dressing for *blistered surfaces* which are required to be kept discharging. The dried powder has been dusted over *indolent sores* and applied to *warty growths*.

Internally, the oil is the most active and satisfactory form in which to administer the drug. It rapidly enters the blood, from which it is excreted by the skin, pulmonary mucous membrane, and kidneys, the secretions of which organs it markedly increases, especially that of the kidneys, and occasionally its diuretic action is carried too far, causing bloody urine and strangury. The heart is somewhat stimulated by full doses, and the uterus is powerfully excited by large doses. This latter effect of savin is constant and marked, and it produces better results than most emmenagogues.

To cause *abortion* (for which object this drug has been criminally administered), savin must be given in doses large enough to cause serious risk to life, in which cases it acts as a violent irritant poison, producing vomiting, purging, collapse, and death.

In *amenorrhœa* 3 minim doses of the oil may be found to establish the *menstrual flow*, after the ineffectual use of iron and ergot. Some have recommended the same treatment in *menorrhagia* depending upon a relaxed condition of the uterus. *Subinvolution* may be benefited by it.

Saccharum.—Sugar as a food possesses well-known properties; it is a nutrient to the adipose tissue of the body and a respiratory fuel. It is used in Pharmacy for a variety of purposes, but the physician rarely orders it except to sweeten mixtures or to assist by its density in the suspension of powders. The Pharmacopœia orders its addition to water to increase the

solubility of lime, and to prevent changes in various unstable preparations.

Saccharum Lactis is used principally, owing to the hardness of its particles, to effect the minute subdivision of substances in powders or pills, and thereby increase their efficacy and insure their equal distribution in each dose.

Owing to its resisting fermentation, it is given to sweeten the food of *dyspeptic* infants, instead of cane sugar; and for a similar reason it has been given in various *irritable conditions* of the *stomach*, and as a food in some *wasting pulmonary diseases*.

Salicin. (See under Acid. Salicylic—page 310.)

Sambuci Flores.—The water distilled from fresh elder flowers cannot be said to possess any therapeutic action, though other parts of the tree are by no means inert, for the inner bark is cathartic and emetic. It is used as the fragrant basis of lotions, and enjoys the popular reputation of a cosmetic, clearing the *facial skin* of marks caused by exposure to sunlight. It is occasionally used (diluted) as a vehicle for internal remedies.

Santali Oleum closely resembles copaiba in its action, and has enjoyed a reputation in the treatment of *gonorrhœa* and *gleet*, and, though hardly equal to all that was expected from it, nevertheless, it must be said to be a valuable addition to therapeutics. It appears to act upon the lining membrane of the bladder and urethra as it is being excreted in the urine.

Dr. Park believes that it acts also upon the pelvic and genital nervous systems. It is a special stimulant to unstriped muscular fibre, and a good astringent to all mucous secretions, as in *leucorrhœa*, *diarrhœa*, *bronchorrhœa*, &c.

If it do not act speedily in 20 minim doses on the gonorrhœal discharge, which it generally diminishes in 60 hours, the probabilities are it will not do much good, and another drug should then be tried, as the paste mentioned upon page 380. The administration of the santal oil should be kept up for some time after every trace of the gleet or gonorrhœa has disappeared. It may be ordered with mucilage in a mixture, each ½ oz. of which can be made to contain 20 minims of the oil, with 1 dr. of syrup, 1 dr. mucilage, and 2 drs. infusion of orange peel. It may, be given before, after, or with food.

Santonica, and Santoninum (its active principle), are used to cause the destruction of worms in the intestinal canal. Santonin is by far the best vermicide for the common round worms—(*ascarides lumbricoides*)—acting speedily and certainly when properly administered. It also kills the thread-

worm, though it appears to have no effect upon the tape-worm when given in safe doses.

It exercises its toxic effect on these parasites in doses which do not produce purgation, though it purges if given in large doses, and it may cause serious cerebral symptoms. Death has occasionally followed the use of the drug in very young children or infants, in which it occasionally produces convulsions, vertigo, and coma, with purging and vomiting. There is some reason for supposing that the samples of the drug causing these symptoms, have not been pure.

Santonin, like many other remedies of its class, produces its effects more certainly if administered after fasting, or after the operation of a mild purge. In castor oil, as pointed out by Kuchenmeister, it acts more satisfactorily than when given in any other way, and the writer can strongly endorse the accuracy of this observation, after seeing its administration in some thousands of instances in the practice of a children's hospital. Unpleasant symptoms were never observed, though the drug was given in full doses; *the oil appears to lessen very considerably the risk of any evil effects.* To a child two years old 2 grs. may be given at bed-time, mixed with a large teaspoonful of castor-oil, and more oil or other purgative administered in the morning if necessary. The worm is generally expelled dead.

Some curious effects are constantly observed to follow the use of santonin. Yellow vision is one of these, and may be noticed shortly after the dose is given—inside an hour; every object appears yellow or green to the patient, and violet objects are recognised with difficulty, though the humours or solid tissues of the eye are not in any way coloured. The effects appear to depend on the action of santonin on the delicate retinal fibres. The retinal blood-vessels are always congested. Perversions or alterations in the smell and taste of food are also occasionally experienced by the patient. The urine is very often stained yellow, orange, or red, apparently varying in colour according to the degree of its alkalinity; and santonin acts as a diuretic, stimulating the kidneys, by which it is eliminated, and it also sometimes renders the bladder irritable. It is supposed to act in the blood in combination with soda. Santonin has been recommended and tried in *nocturnal incontinence of urine in children*, and in *amaurosis*, and has been suggested as a remedy for *colour-blindness*, but its utility in these cases is doubtful. It has been found to remove the discharge in *gleet*, and to diminish slightly the albumen in *albuminuria*.

The result of Brown and Ogston's experiments proves that when given to *young* animals santonin produces cataract.

Santonin may be given in the form of lozenge or as a powder, with a little calomel, to those who cannot bear the taste of castor-oil ; or it may be given in a suppository.

It may be dusted in fine powder over a slice of bread and butter, and is thus eaten by children.

(For a Child 2 years old.)

℞. Pulv. Santonini gr.ii.
Pulv. Saccharr. alb. gr.ii. misce.
M.f.s. ex cochlear. i. para. Ol. Ricini.

Sapo Animalis, Durus, and Mollis.—These substances are introduced into the Pharmacopœia not on account of any supposed therapeutic properties which they possess, but with the intention of assisting, by their physical qualities, to hold different preparations together. Thus, curd or animal soap, enters into several suppositories, whilst hard soap is the excipient for seven pill masses, and soft soap enters largely into the liniment of turpentine.

Soap, however, does possess qualities which make its use in medicine sometimes valuable. Thus, it is an antacid, and, acting like the alkalies, will counteract an excess of acid in the system, and this, too, in a way which cannot so readily be achieved by the soluble alkalies. It can be so easily given in the pilular form that we can manage to have its alkaline effect produced at that part of the canal which the more soluble alkalies generally do not reach. It probably acts as a restorative by supplying to the bile some salts which are natural constituents of that fluid. At the same time it may assist in the emulsifying process going on in the duodenum.

It has been long since pointed out by Paris that soap, added to purgatives like aloes and jalap, mitigates their acrimony, and at the same time quickens their operation ; and this is frequently explained by pointing out the *solvent* power of soap over these bodies. Large doses of soap have been highly recommended as a solvent for *gall-stones*, and as a means of rendering the urine alkaline in cases of *renal calculi*, in both of which instances its use should be pushed.

It acts as a laxative when swallowed or introduced into the rectum, and this latter action of soap affords one of the most simple and convenient methods of emptying the lower bowel.

In the case of infants, a thin, wedge-shaped piece of ordinary hard soap may be introduced through the anus for an inch or more, and held there for a few moments. By its irritation, reflex action is aroused, causing the contraction of the rectum and often of the entire colon. In the case of adults, a small plug as large as the last joint of the index finger may be wholly inserted like a suppository, and allowed to remain till expelled.

Externally, the cleansing properties of soap are well known; and it should be remembered that it often irritates *eczema* and prevents its cure, while sometimes, in sluggish cases, it may act as a healthy stimulant. By far the least irritating soap made is Pear's transparent preparation.

The liniment of soap is a valuable remedy in *sprains*, *bruises*, and *stiffness* of *joints* from inflammatory effusion; its action in such cases is called "discutient." It removes the swelling by stimulating the absorbents, and requires friction in its application. The plaster is supposed to act in the same way, but it probably possesses no specific action beyond the support and pressure which it affords, at the same time giving the affected surface somewhat of the benefits of an internal part.

Sarsæ Radix.—About this drug very different opinions prevail, some authorities condemning it as absolutely inert, while many surgeons firmly believe in its virtues as a diuretic, diaphoretic, and anti-syphilitic. It is probable that the *fresh* root possesses properties which render it of value in the treatment of *secondary* and *tertiary syphilitic affections*, various *skin diseases*, &c.

The dried root produces no appreciable therapeutic effects. The compound decoction occasionally gives results worth its cost; but there are three ingredients contained in it which possess well recognised tonic and diaphoretic properties. Both decoctions make elegant bases for more active medicines, as perchloride of mercury and iodide of potassium.

Sassafras Radix is generally classed as a stimulant and diaphoretic; the oil does produce the effects of a mild stimulant, acting upon the vascular and nervous systems.

The drug is often employed for its flavour, and it gives diaphoretic qualities to the compound decoction of sarsaparilla.

Scammonium and its resin resemble jalap very closely in their action. They are powerful hydragogue purgatives, producing their effects by their *local* irritative action on the bowel, causing in about four hours the evacuation of the contents of the colon in a semi-solid form, soon followed, with much griping, by liquid stools. Five grains of the resin, or ten of the

gum-resin or scammony, are a fair dose for an adult; but this drug should be given in combination with some purgative which would assist its action and diminish the griping. The best way to achieve this object is to combine it with calomel, in which case the dose may be diminished, and the local irritation in the bowel prevented.

Its use is indicated where the thorough evacuation of the contents of the bowel is desired—as, for example, in the case of *impaction of fæces*, or where a quantity of serous fluid is required to be removed from the blood, as in *head injuries* and *dropsies*.

It appears to act more promptly when given with an alkali, and soap answers this purpose well; sulphate of potassium corrects its griping.

Though a powerful stimulant to the intestinal glands, it has but a very feeble effect upon the liver.

It is a favourite remedy in the *constipation of children*.

Scammony has been much used as a remedy for the various forms of *parasites* infesting the alimentary canal, especially of children. There is, however, no evidence to show that it acts as a true Anthelmintic, since its beneficial results in such cases appear to be easily explained by its irritant purgative qualities.

(For an Adult.)

℞. Scammoniae Resinae gr. x.
Hydrarg. Subchloridi gr. vj. misce.
Et divide in pulv. ii. ut. i. statim.

Scilla—Squill is a violent irritant poison, causing death by its action upon the gastro-intestinal mucous membrane, giving rise to vomiting and purging and severe inflammation of the mucous tract. These effects are noticed in a more or less marked degree, whether the drug be swallowed, applied to the broken skin, injected into a vein or into a serous cavity, or under the skin. In its action it closely resembles digitalis in almost every respect, but it is more irritating to the stomach and bowels, and it has valuable expectorant powers which digitalis has not. It is excreted by three outlets—by the bowel, acting as a mild purgative; by the kidneys, which it stimulates, producing diuretic effects; and by the pulmonary mucous membrane, whose secretion it liquefies, thus affording us an excellent stimulating expectorant. It is for this last

effect that squill is ordered most frequently, and it may be well combined with ipecac. The syrup, and the oxymel, in dram doses, possess reliable expectorant powers, and are favourite remedies in the *chronic bronchial affections* of *childhood* and *infancy*, in 5 minim doses. It is rarely used alone as a diuretic, but is generally given with digitalis or mercury. (See page 383.)

Its use is indicated in *chronic catarrhal affections* with profuse *tough* expectoration, and in *dropsies*, in the absence of any inflammatory state of the stomach, bowel, or kidneys. It is especially useful in *cardiac dropsy*.

(As a Diuretic.)

℞. Aceti Scillae ℥iij.
Tinct. Digitalis ℥j.
Decoct. Scoparii ℥viiss. misce.
Fiat mist. cpt. ℥j. ter in die.

(As an Expectorant.)

℞. Pulv. Scillae gr. ij.
Pulv. Ipecac. gr. ij.
Morphinae Hydrochl. gr. $\frac{1}{12}$. misce.
Fiat pil. mitte tales xii., st. i. sexta q. q. hora.

(As an Emetic for a Child one year old.)

℞. Syrupi Scillae
Vini Ipecac. ana ℥j. misce.
Sig. ℥i omni hora ad effectum.

Scoparii Cacumina—Broom is a valuable diuretic of the stimulating class, and resembles buchu and pareira. In large doses it is an irritant to the gastro-intestinal mucous membrane, producing vomiting and purging, though only to a

slight degree, and it may said to be the safest diuretic. It possesses in medicinal doses a slight laxative action, and is especially useful in cases of *dropsy*. As it stimulates the kidneys directly through its elimination, it should be used cautiously in inflammatory or congested conditions of these organs. Broom decoction may be elegantly combined with digitalis or cream of tartar.

℞. Succi Scoparii ad ℥iv.
Tinct. Digitalis ℥iv.
Spt. Ether. Nitrosi ℥vj. misce.
Fiat mistura, cujus capiat ℥i. sextis horis.

Senegæ Radix is one of the most frequently used expectorants. It is credited with several virtues, but is seldom given with any other intention than that of acting upon the bronchial mucous membrane, over which it exercises a stimulating influence. Senega is given in *chronic bronchitis* and *emphysema* when there is *profuse* adhesive discharge; there is difficulty in demonstrating how it acts, though its good is universally acknowledged in the last stages of bronchitis, especially in the aged and weak. Some authorities explain its effects as depending upon a stimulating action on the respiratory centre or efferent nerves, which causes continual coughing, thus keeping the tubes clear and preventing the accumulation of mucus. Farquharson believes that it may act by a tonic influence over the muscular tissue in the bronchial tubes, thereby facilitating the expulsion of their contents. Its action is greatly increased by combining carbonate of ammonium with it.

It causes a warm acrid sensation when chewed, and increases the salivary secretion; in large doses it is an emetic, and may cause purging. It does not increase the amount of urine in health, but augments it in diseased conditions of the kidneys or heart or when there are accumulations of fluid in any of the serous cavities.

The tincture of senega possesses the extraordinary quality of emulsifying fats and oils in quantities so small that its medicinal action may be left out of consideration; thus, 5 minims will emulsify half an ounce of fixed oil. This pharmaceutical property may find some application in therapeutics, as the tincture administered after meals may assist the

emulsification of the fats before they leave the stomach, and thereby probably hasten their absorption by the lacteal vessels of the villi in the small intestine. The writer has administered tincture of senega in several instances of wasting from pulmonary disease, and though he has not had sufficient evidence of the value of the drug, when given with the intention of increasing the weight of the body, he believes it will prove useful.

The following is one of the most popular combinations for chronic bronchitis :—

℞. Infusi Senegae ℥vii.
Tinct. Senegae ℥ss.
Tinct. Camph. Co. ℥ss.
Ammon. Carb. ℥iss. misce.

Fiat mistura, capiat cochleare magnum quartis horis.

Senna is a valuable cathartic. Speedily entering the blood, it produces its effect upon the bowel, and it has been proved to act in the same manner whether administered by the mouth or injected into a vein.* The small intestines are stimulated by it, and both their secretion and movements are increased : it produces thin but not watery motions, generally accompanied by considerable griping pain. Senna when administered to nursing mothers appears in the milk, where, according to Dolan, "its peculiar flavour and odour are distinctly perceptible, though it does not lessen or increase the secretion of milk." It invariably gripes the infant.

Senna should be combined with aromatics to correct the griping, and the compound mixture is a valuable method of administering the sulphate of magnesium.

It is a safe *purgative* for *children :* though causing pain, ill effects are rarely seen to follow large doses.

In *dyspepsia* and *obstinate constipation* the infusion in a wine-glassful dose, to which a tablespoonful of the tincture is added, makes a powerful purgative. It acts, according to the

* Mr. Stockman has recently obtained results which throw considerable doubt upon the action of senna in the blood. He injected poisonous doses without producing any effect.

experiments of Rutherford, slightly as a stimulant to the liver.

The syrup is an elegant, though very uncertain purgative for young children, and it may be used as the vehicle for almost any medicine ordered as a powder. 2 grs. of grey powder given in a teaspoonful of syrup of senna is a very palatable purgative and cholagogue.

The confection is a mild and safe laxative, suitable in most cases of *chronic constipation* when given in teaspoonful doses.

The compound powder of liquorice owes its purgative virtues to senna, and is a safe, palatable, and efficient cathartic suitable for children and adults.

Serpentariæ Rhizoma—Snake-root is a stimulating tonic, possessing feeble aromatic properties. It acts like the members of the same class in the manner already described.

Small doses increase the appetite and promote digestion by mildly *stimulating* the mucous membrane of the stomach to pour out increased secretion. Large doses exaggerate this effect, and produce irritation in the stomach and bowel, as evidenced by nausea, diarrhœa, reflex headache, &c.

It is employed in *dyspepsia* arising from want of tone, or atrophy of the gastric tubules, and its supposed stimulating properties have obtained for it some repute in low febrile conditions, as in *typhus*, *typhoid*, *diphtheria*, and *rheumatism*.

Snake-root does not, as once believed, possess any value in the treatment of *rabies* or *snake-bites*, nor is there any evidence of its emmenagogue or diuretic properties.

The drug is seldom employed; it appears to lose its properties by keeping, and many samples which have been long in the possession of the pharmacist seem to be inert.

Sevum Præparatum—Suet is a well-known fat and a nutritious article of diet, but it is introduced into the Pharmacopœia solely for its physical qualities, finding a place in blistering plaster and mercurial ointment.

Sinapis—Mustard is rarely prescribed internally, except as an emetic in cases of poisoning, when a tablespoonful, stirred up in a tumblerful of warm water, may be administered, and warm water freely swallowed afterwards. It is largely used as a condiment, and is supposed to increase the appetite, though it is almost certain that the gastric juice is not markedly increased by its local action.

Externally, mustard is the best counter-irritant for general purposes; it differs from cantharides in the rapidity and amount of pain attending its action. When applied to the skin, mustard quickly causes a flow of blood to the vessels of the part, and if its application be continued too long, inflam-

mation of the skin, vesication, and painful sloughing or ulceration may follow. As mustard is a very frequently applied remedy, and often required on a moment's notice, the student should be able to rapidly make a sinapism.

The plaster is spread on a variety of fabrics, and covered with tissue paper, muslin, cambric, &c., but every requirement is met by the following rapid, cheap, and convenient plan:—

The required quantity of mustard is put into a large cup (about a tablespoonful of mustard makes a fair-sized sinapism) and as much *cold* water is poured upon it as will make a soft uniform cream, not quite so fluid as to flow or pour readily out. A sheet of paper is procured of such a thickness as will readily permit the fluid part of the cream to soak through it, without becoming too easily torn. Old newspaper is the best texture for this purpose, and it should be laid out upon a table or smooth surface, the mustard cream turned out of the cup, and roughly smeared or spread over its centre. The circumferential or clean parts of the paper are folded over this, making the required shape and size of the sinapism, which is lifted off the table, and the surface which was undermost applied direct to the patient's skin. Less than a minute is enough (when the materials are at hand) to perform this little operation. If not made in the sick room it should be carried there on a dinner plate.

It will be observed that the mustard does not thus come in contact with the skin, but only its moisture, which soaks through, the paper being between the skin and the cream. The sinapism should be kept in contact with the patient's body by a bandage or pad of flannel for 15 to 30 minutes. In the case of children, the mustard, before being moistened, should be mixed with from 1 to 4 parts of wheaten or corn flour to dilute it. Often the question is asked the young practitioner, How long should such an application be permitted to remain? This is difficult to answer, and he should direct that, after a few minutes the edge of the sinapism be raised and the redness of the skin noticed. If it remains scarlet for a few minutes the application should be removed, but if the redness is only temporary the sinapism should be kept on longer.

A great mistake is made in directing the surface to be immediately covered with cotton-wool, greased linen, &c.; it should first be always wiped dry and clean with a very soft rag; otherwise as much acrid moisture may be left on it as may produce vesication and dangerous ulceration in the delicate skin of an infant.

The mustard bath is a favourite method of applying counter-irritation—to the feet for *headache;* to the abdomen for *amenorrhœa*, at the time of the expected period ; or to the loins in *suppression of urine*. About 2 oz. of powdered mustard seeds to 10 gallons of hot water (102°) will make an agreeable bath. In a similar way it may be used as a *hot pack* in *rheumatism*, &c. (See under Aqua.)

Pain of various kinds is relieved by the application of a sinapism ; but, as a rule, it is aggravated if it be placed directly over the pained nerve. It should, as a general rule, be applied over the site of its origin near the spine.

The action of mustard when placed over the seat of *internal inflammations*, or over the chest and legs in case of *stupor*, is to be explained on the theory of reflex action. There is no difficulty in seeing that the impression produced by an irritant on the peripheral endings of any nerve may be conducted to the nerve centre or brain, and from thence may be reflected to any other part of the nervous system ; thus, a sinapism on the chest may stimulate the respiratory or cardiac centres. (See under Cantharis—page 352.)

Sodium—The salts of sodium possess such close resemblance in their pharmaceutical, chemical, and therapeutical properties to those of potassium, that only a brief enumeration of them is necessary. Speaking generally, sodium salts differ in the following respects from the corresponding potassium compounds—(1) they are less caustic when used externally; (2) they do not exert the same depressing influence over the heart, and hence are not poisonous in the sense that potassium salts are ; (3) they are less diuretic ; (4) they form less soluble salts with uric acid ; (5) owing to the entire system being saturated with sodium, medicinal doses do not appreciably affect metabolism (Mitchell Bruce); and (6) they are much less diffusible.

Soda Caustica is seldom employed ; it is identical in its action with caustic potash, but is much weaker. Mixed with an equal weight of recently burned lime, and made into a paste with alcohol, it is known as London paste, and is used as a caustic application to the *tonsils*. (See Potassa Caustica.)

Liquor Sodæ resembles the liquor potassæ, but is seldom used. It possesses little if any effect upon the kidneys or bladder, though it will render the urine alkaline after a time.

Soda Tartarata.—Rochelle salt closely resembles the tartrate of potassium, though its diuretic powers, in ½ to 1 oz. doses, are so feeble that they are doubted by some. It is a very popular saline purgative, acting as a strong stimulant to

the intestinal glands. Small doses have the power of rendering the urine alkaline like the potassium salt, though not so certainly.

Its cathartic action is most unreliable unless given in a full dose, so that it is a good rule to give at least six drams. Often four drams will be administered and *no effect whatever* be noticed, while five or six drams may purge freely. It should be given always in a large quantity of water when its cathartic effects are desired.

Hay has recently pointed out the power of salines when administered in *very concentrated* solutions to cause a rapid concentration of the blood if swallowed when the alimentary canal is empty, and he suggests their use in this way to rapidly remove the serous accumulations in dropsies. (See page 418.)

One ounce of Rochelle salt dissolved in a glassful of ærated lemonade or ginger ale makes a most elegant and pleasant saline purgative. For the mode of action see under Magnesii Sulphas.

This salt also enters into the composition of a Seidlitz powder which consists of

ROCHELLE SALT, 2 drams;

BICARBONATE OF SODIUM, 40 grains;

mixed and folded in a *blue* paper; to be taken in effervescence with

TARTARIC ACID, 35 to 40 grains;

which latter is generally folded in a *white* paper.

Sodæ Chlorinatæ Liquor.—The hypochlorite of sodium contained in this liquor is readily decomposed when it comes in contact with the weak acid compounds of the body.

The hypochlorous acid, which is given off in contact with any acid, is a powerful oxidising agent, giving off its active oxygen, which greedily attacks most animal substances, whilst its chlorine enters into combination with the hydrogen of many bodies. This solution is probably a strong disinfectant —that is, it has power to destroy the germ or contagion of disease, and so render it incapable of communication from a patient to a healthy individual. It is antiseptic, because it destroys septic organisms, and thus arrests decomposition. In addition to these properties, this drug is regarded as a stimulant. These varied qualities render it of use in low *typhoid conditions* and *adynamic fevers*, especially in *diphtheria* and *malignant scarlatina*.

It should be given alone with water—1 scruple mixed with 1 oz. every two or four hours.

Externally, it is an invaluable remedy *wherever fetor is observable*, as a gargle in *putrid throat affections*, in which case it may be made of the same strength as for internal use. (See Chlorine and Calx Chlorinata.)

Sodii Arsenias—(See Acid. Arsenic.)—It contains so little sodium in each dose that this may be entirely overlooked; and the salt should be regarded as an arsenical preparation; 5 to 10 minims of the liquor may be given in infusion of calumba, when the use of arsenic is indicated.

Sodii Bicarbonas closely resembles the bicarbonate of potassium (which see). Like it, it is antacid, and though less irritating, it possesses greater saturating power. It has also a more soothing effect upon the stomach than the corresponding potassium salt, but is very inferior to it as an antilithic, since the salts which it forms with uric acid are only slightly soluble. This is seen in *gout* in the deposit which forms about the joints, which consists of urate of sodium. It does harm in cases where there are phosphatic sediments in the urine.

In the form of Vichy water the bicarbonate of sodium has been long in use as a remedy for many complaints supposed to be of *gouty* origin, and it has been found to relieve *frontal headache*. The official effervescing solution when administered with milk is sometimes the only food retained by an irritable stomach. The lozenges are used in *dyspepsia* and *bronchial catarrhs;* in this latter condition their efficacy depends upon their probable action upon the cilia.

Externally, the bicarbonate of sodium, as recently pointed out, possesses an almost magical power when applied to painful *burns* and *scalds*. If used *immediately* after contact with great heat, what would otherwise be a painfully blistered spot is entirely relieved, and often in a few hours may be found to differ in no way from the healthy surrounding skin. It may be applied, in solution of any strength, and the salt made into a paste with water and rapidly applied to the injured part generally produces surprising results, if vesication has not already occurred.

The solution of bicarbonate of sodium has been recently strongly recommended in *acute tonsillitis* as a gargle, or brushed over the swollen glands.

It is used in a variety of *cutaneous affections*, and a large tablespoonful to a pint of water, sponged over the itching skin in *urticaria* and other complaints, often gives relief; it may be combined in these cases with Prussic acid. It relieves the pain of *wasp stings*, but is inferior to ammonia in this respect.

Sodii Bromidum acts like the bromide of potassium—(page 340)—only it is less irritating to the stomach and less depressing upon the heart.

Sodii Carbonas resembles the bicarbonate, but is more caustic and more soluble. It makes a very good effervescing mixture when given with lemon juice, superior, indeed, in its sedative effect upon the stomach to any other combination; and with it hydrocyanic acid can be given. The dried carbonate of sodium is the most convenient antacid to give in pill or powder; it is nearly three times stronger than the crystallised salt.

℞. Sodii Carbonatis ℥vj.
Acidi Hydrocyanici Dil. m.xxx.
Aquae Destillatae ℥x. misce.

Fiat mistura, cujus cpt. ℥i. cum ℥ss. succi limonis recentis tertiis horis.

The alkaline bath is made by dissolving 8 oz. of carbonate of sodium in a large bathful of water—say about 80 gallons.

Sodii Chloridum enters so largely into every tissue of the body that life cannot be sustained when it is withheld. It is absolutely necessary wherever cell growth is rapidly going on; animals would soon die without it (especially growing animals). Small doses are restorative and tonic; larger doses (1 to 2 oz.) are either slightly purgative or emetic.

It possesses expectorant qualities if given in dram doses—every two or four hours—and small quantities act as ciliary excitants by reflex action when slowly sucked in the mouth. It is excreted by the mucous membranes of the body. It is a certain antiseptic, and destroys the small thread worm, *ascaris vermicularis*. When swallowed or administered by the rectum, ½ oz. may be dissolved in 3 or 4 ozs. of water.

1 lb. of salt and 3 gallons of water make a convenient substitute for sea-water.

It is used sometimes in about the same proportion (1 to 30) as a gargle in *chronic throat ulcerations*, and is a valuable antidote in cases of *poisoning with nitrate of silver*, or after swallowing a *leech*.

Betz has used chloride of sodium in *internal hæmorrhages* with marked benefit. He dissolves a teaspoonful in half a

litre of water, and administers it by the mouth at the rate of 3 tablespoonfuls every 5 minutes.

Recently, Michael of Hamburg and Samuel of Königsberg have advised the *hypodermic* injection of several litres of an 8·75 per cent. solution of salt into the subcutaneous cellular tissue in *cholera*.

Michael believes that it will be free from the dangers attending the introduction of solutions by *transfusion*. He points out that the injection of large quantities into the cellular tissue of the neck, as recommended by Samuel, might produce œdema of the glottis, and he advises the site to be chosen somewhere over the abdomen or inside of the thighs, and insists that massage should be employed to cause the effusion or dispersion of the fluid. It may be thus used in *acute anæmia* from hæmorrhages of all kinds, instead of transfusion.

Sodii Citro-Tartras Effervescens.—This agreeable antacid and purgative is the official representative of the popular "Granular Citrate of Magnesia," only the latter usually contains some Epsom salt. It may be taken in tablespoonful doses, dissolved in a large quantity of water, as it seldom affects the bowel unless freely diluted.

Sodii Ethylatis Liquor is a valuable caustic, powerful and almost painless; it is antiseptic. Brushed over small nævi, it has been found to cause their obliteration with very little deformity. It should be applied upon a glass rod or brush, and, just as in the application of iodine liniment to glandular swellings, it should be used till a scab forms, and then its application should be withheld for a few days till the scab or destroyed cuticle falls off, when it may be re-applied. If pain results, a drop of chloroform, which converts the ethylate into ether, and chloride of sodium may be laid upon the part.

Sodii Hypophosphis resembles in its action the lime salt of the same name (which see, page 346). It has been supposed to give all the benefits of free phosphorus without any of its drawbacks; but the evidence of its usefulness in *scrofula* and *phthisis* is regarded by several authorities as somewhat doubtful.

Sodii Iodidum resembles closely the iodide of potassium (page 106). It can be tolerated by the stomach in larger doses than the potassium salt.

Sodii Nitras is only used to prepare arseniate of sodium or nitric acid.

Sodii Nitris is not official; it is noticed in the non-official remedies.

Sodii Phosphas.—Though this salt has been extolled as a substitute for phosphorus, it has not the slightest action of the kind. It is a most valuable saline purgative, and can be safely used where nearly every purgative is contra-indicated—in serious cases of *enteric fever* with bowel complication. It can, owing to its freedom from unpleasant taste, be given instead of common salt in beef tea or soup. This is a most satisfactory plan of giving a mild cathartic in *fevers;* half an ounce often will be found enough, but three times this quantity may be administered. It is also recommended in small doses for the qualities which it possesses in common with all the sodium and potassium salts—antacid, diuretic, antilithic, &c.

Sodii Salicylas. See under Acid. Salicylic., page 310.

Sodii Sulphas—Glauber's salt is not much used now except in veterinary practice, though, by its stimulating effect upon the glandular intestinal apparatus, it is a safe and certain purgative. The experiments of Rutherford also prove that it is a moderately powerful stimulant to the liver. See under Magnesii Sulphas, its action explained, page 417.

Sodii Sulphis is a weak antiseptic, preventing fermentation, like sulphurous acid. It is given in 20 gr. doses in various *stomach* affections characterised by the presence of sarcinæ and torulæ, and, in solution, has been used externally in various parasitic skin diseases.

Sodii Sulphocarbolas possesses the antiseptic and antipyretic qualities of carbolic acid (page 301). It has been given in *fermentative states of the stomach, cholera, diphtheria, scarlatina,* and all the *fevers* and in various *septic* conditions.

Sodii Valerianas.—Used only to prepare the valerianate of zinc. It may be given in 5 gr. doses.

Spiritus Rectificatus, Spiritus Tenuior, and Vini Gallici. See under Alcohol, page 315.

Staphisagriæ Semina contain at least two important alkaloids—Staphisagrine and Delphine. The former can hardly be said to have given any results which entitle it to a place in therapeutics, though it is a powerful respiratory poison like curara. Delphine acts like aconite, and when applied over painful cutaneous nerves causes numbness and tingling, and diminishes pain like veratrine. It has been used as an ointment (20 grs. to 1 oz.) in *neuralgia.* Internally it slows the pulse like aconite, and diminishes the number of respirations,

causing death by asphyxia with spinal paralysis. It has been given in *asthma*, *rheumatism*, *neuralgia*, and *dropsies*.

Stavesacre seeds are, however, introduced into the B.P. on account of the satisfactory power which their ointment possesses over the parasite that frequents the hair of the head. The official ointment destroys pedieuli with safety. Formerly the seeds were given internally as an emetic and vermifuge, but their use is restricted to their antiparasitic action.

Stramonii Semina possess properties identieal with belladonna, and they yield an alkaloid which is identieal with hyoscyamine and isomeric with atropine. The leaves of the plant have been long used as a remedy when smoked like tobacco for *spasmodic* bronchial affections, chiefly *asthma*. The extract made from the seeds should not be given in doses larger than $\frac{1}{3}$ grain; it sometimes prevents the asthmatic attacks when given a few hours before the expected seizure.

Stramonium belongs to a natural group, called from their action, by Headland—Deliriants. The group contains Belladonna, Hyoscyamus, Stramonium, and Datura Tatula. (See Daturia amongst the Non-official Remedies.)

Strychnina—The action of this alkaloid is noticed under Nux Vomica—Page 425.

Styrax Præparatus—This balsam resembles those of Peru and Tolu in its action, being a feeble, stimulating expectorant. It possesses some tonic influence over the genito-urinary mucous membrane, and has been used in *gonorrhœa*. 20 grs. may be given, made into a bolus with powdered sugar or liquorice.

Sulphur—Sublimed sulphur, when administered in a full dose (say 2 drams), passes unaltered through the stomach, and meeting the alkaline bile, a small quantity is absorbed after its solution in this fluid. This quantity, after circulating through the blood, is excreted by the skin in the form of sulphuretted hydrogen, staining any metallic substances with which it comes in contact. Some of it is also excreted by the kidneys, as sulphates, and some passes off by the respiratory mucous membrane, which it stimulates. Of the surplus in the intestine a small quantity is converted into sulphides by the bile, and acts as a mild irritant (just as sulphide of calcium would do, if administered); this causes slight purgation, producing large, softened motions. The residue, which constitutes the greater part of the dose, acts by the angularity of its gritty particles, the part of an irritant, like bran, &c., and increases the peristaltic movements of the bowel, and thus aids purgation. This seems to be the most probable explanation of the

internal action of sulphur in full doses. Since it exists in large quantities in the bile, sulphur will act as a restorative in some conditions of the system characterised by a deficiency of that fluid.

Its purgative action renders it very useful in the treatment of *hæmorrhoids*, and Neligan believed that in addition to its effect as a cathartic in this complaint, it exercises a beneficial soothing influence over the *hæmorrhoidal* vessels, whereby their calibre is diminished and the symptoms ameliorated.

It has been used as a purgative in *skin diseases*, but it often aggravates matters, if there is active cutaneous inflammation going on.

Sulphur is an expectorant, probably, stimulating as it passes out, the mucous epithelial cells of the respiratory passages, with their cilia.

All the virtues of sulphur are found in a vegetable containing it in considerable quantity (the onion), and it will be found for every purpose the most satisfactory form for the administration of the drug. The Spanish onion, boiled for one or two hours, and eaten freely at bed-time, is a certain purgative, and possesses most decided expectorant qualities. In cases of *chronic catarrh* of the larger *respiratory tubes*, it is more efficacious than any official expectorant, probably because it contains a volatile principle in addition to the sulphur.

Sulphur has been praised as an external and internal remedy in *chronic rheumatism*, and forms a principal ingredient in the "Chelsea Pensioner." (Page 396.)

The sulphides have been highly commended in various *suppurative skin affections*—as *boils* and *acne;* the onion treatment has proved much more satisfactory in the writer's hands than sulphide of calcium, which is occasionally uncertain and intolerable. (See page 348.)

Externally, sulphur is the best known treatment for the *itch;* a thorough application of the official ointment to the skin, after a hot bath and good scrubbing with soap to break up the furrows of the insect, generally proves efficacious. The pentasulphide of calcium, prepared by boiling 1 oz. of powdered sulphur with about an equal quantity of mortar, lime-putty, or slaked lime, in half a gallon of water, is a more certain and elegant application. It should be lightly brushed or sponged over the affected part. It appears to act by instantly giving off sulphuretted hydrogen on coming in contact with organic matter, this gas destroying the insect. It is free from the objectionable greasiness of the ointment, and is less irritating, since no previous scrubbing or soaping is necessary.

Sulphur has been advocated as a local application to the

false membrane in *diphtheria;* it is questionable if it has the least action in this disease.

The ointment is recommended in *acne*, and often does good when well rubbed into the indurated spots. The precipitated sulphur in a lotion is an unobjectionable way to use this remedy for *acne*.

℞. Sulphur. Præcipitat. ʒij.
Glycerini ʒij.
Aquæ Rosæ ad ʒviij. misce.
Fiat lotio. Applic. mane nocteque.

Potassa Sulphurata acts like sulphur when given in very small doses, stimulating the skin and intestines, and it is eliminated in the same way. It is a local irritant, and in large doses acts like an irritant poison, and produces narcotic symptoms and convulsions.

Externally it is used as a bath (5 oz. to a large bath of warm water) in *scabies;* or the official ointment may be employed.

Its internal use is also advocated in various *chronic skin affections* in 3 gr. doses, in a pill. It will cure *itch*, like sulphur, when given internally, if its use is persisted in. It resembles the calcium salt which see (page 348).

Sulphuris Iodidum.—This remedy possesses some of the properties of the two substances entering into its name. It is principally used externally as a remedy in *parasitic diseases*, and occasionally in *acne* and *scrofulous affections*. From experience of its use in an agricultural district where *herpes circinatus* was exceedingly common (being transmitted to the human species from the cow), this remedy was found more certain than any other, scarcely ever failing to entirely remove all traces of the parasite when applied a few times to the diseased spots. It is, however, liable to produce irritation of the skin, but this greatly depends upon the method of its preparation; the official ointment requires great care and laborious trituration, otherwise the hard, gritty iodide is left in little masses, which produce local inflammation of the skin when applied.

Sumbul.—This root is supposed to possess nervine tonic properties closely resembling valerian and musk, and has been used as a substitute for this latter drug in low *typhoid* states and *fevers*, *asthma*, *delirium tremens*, and *epilepsy*.

Tabaci Folia.—Owing to its uncertain action in small doses, and its deadly power in large doses, tobacco is very seldom employed in medicine. When smoked, the leaf is one of the most valuable sedatives for the *restlessness* of an *overworked* and *worried brain;* but there can be little doubt that the mass of smokers become the slaves of habit, and in them very little, if any, therapeutic result is observed. Occasionally atrophy of the optic nerve follows prolonged and excessive smoking.

Tobacco is a local irritant; when used as snuff it is a good errhine, increasing the nasal mucus. Chewed in the mouth, or smoked, it acts first as a stimulant to the nerve endings in the salivary glands, increasing the amount of saliva. If its use be continued, or the dose increased, this effect gives way to paralysis of these nerves, and dryness of the mouth results. On reaching the stomach, tobacco exercises the function of an emetic; this result follows its use also by the rectum. Finding its way into the blood, tobacco produces, in large doses, contraction of the pupil, collapse, great muscular prostration, coldness of the skin, diuresis, vomiting and purging, diminution in the force of the heart (which it appears to first tetanise and then paralyse), and, after producing general paralysis through its action on the cord and on the nerves, it causes death by the respiratory muscles being paralysed. The brain is not disturbed in its functions, and the temperature falls.

Subcutaneous injection of nicotine causes death as rapidly as Prussic acid, and the late official enema was a dangerous preparation, and has been omitted with advantage from the new B.P.

Its paralysing effects have led to its successful use in the treatment of *tetanus*, *strychnine poisoning*, and *asthma*. Small doses, as the smoking of a pipeful, are believed to be diuretic and laxative to those unaccustomed to its influence. Its use in surgery in causing *muscular relaxation* is now given up for chloroform.

Tamarindus.—The pulp of the tamarind is seldom used alone; it is a laxative in doses of 1 to 2 oz., increasing the peristaltic movements of the intestines. It is said to be refrigerant, and is occasionally used in fevers in the form of "tamarind whey," made by mixing an ounce of the pulp in a little boiling water, and adding the infusion to a quart of milk. Its refrigerent action may be accounted for by the vegetable acids, malic, citric, &c., which it contains.

Taraxaci Radix has long enjoyed the reputation of a tonic cholagogue, diuretic, and laxative. As it is now obtained from

the chemist it has little therapeutic power. The tonic effects of the *fresh* juice, prepared by the patient immediately before use, or even of an infusion prepared just after the root is gathered, when the juice is bitter, are decidedly good, and it is a useful vehicle for more active tonics.

Terebinthina Canadensis, though possessing all the properties of the oil of turpentine, is only introduced into the Pharmacopœia for its physical qualities. It is largely used in the preparation of microscopic objects, and has been occasionally given (made into a pill), with carbonate of magnesium for *gleet* and *chronic gonorrhœa.*

Terebinthinæ Oleum—Turpentine is largely used as a counter-irritant ; it possesses advantages over Cantharides in the speed with which it acts. The ordinary turpentine stupe is made by sprinkling the oil over flannel cloths wrung out of very hot water, and applying them quickly to the part. In this way rapid vesication can be produced. (For the rationale of its action, see under "Cantharis.")

Small doses produce contraction of the capillaries, and the vapour causes the minute pulmonary vessels to contract after inhalation.

In large doses, turpentine acts as a general stimulant, and, if it does not purge or pass off by the bowels, it causes inebriation, like alcohol, and in very large doses it depresses the functions of brain, medulla and cord, dilating the vessels, and lowering blood pressure and respiration. After circulating in the blood, it is eliminated by the skin, respiratory mucous membrane, and kidneys, acting as a diaphoretic, expectorant, and diuretic ; and is useful in *bronchitis* and *hepatic dropsy.* It is apt to cause strangury and bloody urine, and should not be used where the kidneys are diseased. Turpentine also possesses very decided anthelmintic properties, but must be given in large doses (½ oz.), and its combination with castor oil renders it much less liable to cause strangury than if given alone. The *tape-worm* is dead on its expulsion after the use of this remedy.

Turpentine is much used as a hæmostatic in *pulmonary hæmorrhage;* and by far the best method of administering it in this complaint is to surround the patient with vapour by pouring turpentine into vessels in which a little hot water has been placed. Coming into direct contact with the bleeding point, the astringent qualities of the drug are exercised to best advantage. Large doses are valuable in *internal hæmorrhages* by reducing the blood pressure, and ten minims every hour may save life in hæmorrhage from the bowel in *typhoid fever*

and *dysentery*. Dr. Nicholson has obtained good results with turpentine in *secondary syphilis* and *phagadenic ulcerations*, and observed that it caused the coagulation of the blood in an *aneurismal sac*. The enema is a valuable remedy in *tympanitic distention of the abdomen;* it excites such uniform contraction as expels all accumulations of imprisoned gas in the bowels. Turpentine has a prophylactic and curative action in cases of *gall stone*, and there is evidence to show that it may cause the solution of small calculi in the gall bladder. It is a powerful antiseptic, and has been given with success in *diphtheria*. Recently Dr. Croker has given turpentine with success internally in *psoriasis*, *eczema*, *pityriasis*, &c. He believes it has a decided action upon the skin through its constringing influence over the cutaneous capillaries.

Oil of turpentine which has been kept some time is rich in ozone, and is a valuable antidote to the poison of phosphorus.

The confection is an agreeable method of administering the drug, and has been found beneficial in *iritis*, in *hysterical affections*, and in the *hæmorrhages of purpura*, in which latter it is invaluable. Turpentine may be easily given in capsules or emulsion.

℞. Olei Terebinthinae ℥iv.
Pulv. Gum. Acaciae ℥iiss.
Syrupi Aurantii ℥j.
Mist. Amygdalae ad ℥viij. misce.

Capt. ℥i. omni hora, p.p.a.

Theobromæ Oleum is introduced into the Pharmacopœia as a basis for suppositories.

Theriaca holds its official position owing to its excipient qualities, entering into the various pill masses. In large doses it is laxative and nutrient.

Thus Americanum is not used internally. It is added to plasters on account of its mild stimulating influence on the skin, and also on account of its toughness and adhesiveness—very desirable qualities in a plaster.

Thymol acts as a feeble caustic, and as a powerful antiseptic. 1 gr. dissolved in 2 oz. water makes a solution which instantly puts a stop to putrefactive or fermentative changes in any fluid to which it may be added. It is thus a more potent

antiseptic than carbolic or salicylic acids; an ointment (1–8 of vaseline) has been used by Squire as a remedy in *parasitic skin diseases.* A solution of 1 part of thymol in 18 of petroleum or 15 of ether is a valuable remedy in ringworm of the scalp or beard; it penetrates into the hair follicles.

The following formula is used at the London Throat Hospital in *laryngitis* and *bronchial affections*:—Thymol, 20 grs.; spirit, 3 drs.; carbonate of magnesium, 10 grs.; water to 3 oz. A teaspoonful to 1 pint of water at 150° for each inhalation.

Burns washed first with a watery solution (½ gr. to 1 oz.) and then brushed with an oleaginous solution (½ gr. to 1 dr.), heal rapidly.

A solution in water (1 in 1,000) is used as an injection in *leucorrhœa*, and as a lotion to *wounds, chronic eczema, ozæna, psoriasis, and ulcerated throat.* Thymol gauze and lint are used as antiseptic surgical dressings.

Internally, thymol has an action like carbolic acid, and also produces symptoms like those seen in turpentine poisoning. The centres in the medulla and cord are paralysed, the temperature, respiration, and blood pressure falling markedly before death. It is eliminated by the bronchial and renal surfaces; according to Brunton, these surfaces are congested, and the lungs and kidneys are inflamed in animals poisoned by thymol. It has been given by Silva in *typhoid fever, pleurisy,* and *pneumonia*, in doses of 3 grammes; it caused persistent diminution of temperature, and no ill effects whatever. Decidedly beneficial results have followed its administration in *chronic cystitis* with profuse discharge, and it has been recommended in *diabetes.* In *diphtheria*, good results have been obtained by Warren, who gives it in combination with chlorate of potassium, quinine, and brandy.

Professor Bozzolo has written to urge the administration of thymol in *cholera.* He states everything points to its being *the* remedy in this disease.

It should never be given in solution, as it causes a burning sensation in the throat and mouth.

Tragacantha.—This gum is only employed to aid the suspension of heavy metallic powders in mixtures, it swells upon the addition of water into a thick mass or mucilage, which readily diffuses through any quantity of water to which it may be added. In the official mucilage of tragacanth it is doubtful if the gum can be correctly regarded as in a state of perfect solution. The paste mentioned on page 46 or the official glycerine is an excellent pill excipient.

Uvæ Ursi Folia is a vegetable astringent and tonic, owing to its tannin. It contains arbutin, which, after absorption, is

split up into hydroehinon in the blood, and, as the sulphate of this body, passes out in the urine; it is highly reeommended in *chronie inflammatory conditions of the bladder* where there is mueh discharge. It has been used with advantage in *menorrhagia, dysentery,* and *gleet.* (See under Arbutin, in the Nonoffieial Remedies.)

Uvæ.—Raisins are gentle laxatives; they are used prineipally for their flavour.

Valerianæ Rhizoma.—Valerian acts as a tonie and stimulant to the nervous system, and is espeeially useful in *hysteria.* There is mueh doubt about the manner in whieh it aets. It eontains a volatile oil, whieh paralyses the eerebral nerve eentres and eord, and reduees the blood pressure, and slows the pulse (Brunton). Large doses of the infusion of the rhizome inerease the rapidity and foree of the ventrieular eontraetions, eause an inerease in the eutaneous seeretion, and produee hieeough, nausea, vertigo, and slight mental disturbanee. The good it effeets in disease appears to the writer *to be owing to its diminishing the irritability of the terminations of the sensory nerves throughout the body.* This probable explanation of the aetion of valerian mentioned in a former edition of this work is supported by the results of Martel's reeent observations. This surgeon found that a strong deeoetion possessed marked *local sedative* influenee when applied to *painful wounds.* He states that the inhabitants of Normandy use a lotion made from the root to relieve the pains of fraetures and wounds.

It has been used with very doubtful sueeess in *chorea, epilepsy, whooping-cough, laryngismus,* &e.

The salt of zine with valerianie aeid, in addition to its antihysterieal properties, possesses weak anti-periodie qualities; and, eombined with quinine and opium, is a most valuable remedy in the treatment of *neuralgia,* espeeially if there be a tendeney to show signs of periodieity.

Dr. Cole has reported a ease of *diabetes* sueeessfully treated by 5 gr. doses of this salt every 6 hours.

℞. Zinci Valer. gr.v.
Quininae Sulph. gr.v.
Pulv. Opii gr.iss. misce.
Fiat Pulv. Signa, "To be taken at bed-hour, in wafer paper."

Veratrina & Veratri Viridis Rhizoma (See Sabadilla).

Vinum Aurantii and Vinum Xericum are introduced into the Pharmacopœia for their solvent properties; the former to make quinine and citrate of iron wines, and the latter to form the menstruum for the remaining wines.

Zincum and its salts. When used externally these substances possess two properties—they are astringent and corrosive.

The astringent quality probably depends upon their forming insoluble albumen compounds, causing condensation of the tissue elements, at the same time producing contraction of the smaller vessels. The corrosive action depends upon their affinity for water, which they rapidly extract from the tissues, thereby causing their death. The effect varies in intensity from the powerful action of the chloride and iodide to the mild influence of the sulphate or oxide.

When administered internally, the zinc salts soon enter the blood, in which fluid they remain for a time, probably as albuminates, and are gradually and slowly eliminated in the fæces and slightly by the kidneys. After a long course of zinc medication, symptoms of chronic poisoning may show themselves, not unlike what are seen in cases of lead poisoning.

Acetate of Zinc.—This salt is used as a local astringent, and with some skilful practitioners is their favourite remedy in *gonorrhœa;* thus :—

℞. Zinci Acet. gr. xxv.
Tr. Lavand. Co. m. xxv.
Aquae Destillatae ℥x. misce.
Fiat injectio secundis horis utenda.

Carbonate of Zinc and *Calamina* are used as mild, unirritating astringents or "drying applications" to *excoriations*, *intertrigo*, &c. They resemble the oxide in their action upon *eczema*.

Chloride of Zinc is much used as a powerful caustic by surgeons for the destruction of *lupoid*, *cancerous*, and other *growths*. It is best applied mixed with about three parts of dry flour, and laid upon the diseased spot. Great care is necessary to prevent its spreading to the surrounding healthy parts; this is best accomplished by sprinkling them over with plaster of Paris. The chloride is unsatisfactory as a caustic unless the skin is broken or the cuticle removed.

The astringent qualities of the chloride have rendered it a valuable remedy in *gonorrhœa*, injected in the proportion of about 1 gr. to the ounce every two hours. It probably destroys the low organisms upon whose presence the disease may depend. It is a powerful antiseptic and deodorant. The liquor, diluted with forty times its bulk of water, arrests putrefaction and decomposes all gases with which it comes in contact. It may be used as a lotion to *putrid ulcers*, in the proportion of 3 minims to each ounce of distilled water.

Oxide of Zinc is chiefly used as a mild, soothing astringent, in *eczema*. The zinc ointment is the best remedy for the troublesome *eczema of childhood* and *infancy*.

Internally, the oxide is found to enter the blood as lactate or chloride, and to exercise the functions of a mild astringent and sedative to the nervous system.

In the *sweating* of *phthisis* the oxide has long enjoyed a high reputation, and may be used in the following form :—

℞. Zinci Oxidi gr. v.
Ext. Belladonnae gr. ss. misce.
Fiat pil. mitte tales xvi. ot. i. ter in die.

Sulphate of Zinc is the most popular local astringent, and is used as an injection in the following strengths :—

In *Gonorrhœa*, ℈i to 10 oz. water ; in *Leucorrhœa*, ℥ss to 1 pint ; in *Otorrhœa*, ℈i to 1 pint ; in *Ophthalmia*, 1 gr. to 1 oz.

The dried salt is used as a caustic to *uterine* and other *ulcers*.

Internally, as a nervine sedative the sulphate has been found highly useful in *chorea ;* given in doses, beginning with 2 grs. for a child of about 7, gradually increased to 10 grs., 3 times a day. The stomach in a very short time becomes markedly tolerant of large doses. Its use has been advocated in *epilepsy*, and other *convulsive ailments*, in *bronchorrhœa*, and *diarrhœa*, but with varying success.

In doses of 30 grains, sulphate of zinc is the speediest and safest emetic. It acts, whether swallowed or injected into the circulation, and is especially useful in cases of poisoning, being quicker in its action than ipecac. and much less liable to be followed by depression than tartar emetic. It acts by irritating the nerve endings in the stomach, and hence has been regarded as the type of "Direct Emetics." Its emetic action when injected into the veins may be explained by the irritation which it produces by coming in contact with the

gastric nerves upon its elimination by the mucous membrane of the stomach. It is doubtful if it acts upon the vomiting centre like apomorphine or emetine.

For the *Valerianate of Zinc* see Valerian.

Oleate of Zinc acts like the ointment of the oxide (see page 309).

Sulphocarbolate of Zinc possesses the properties of the sulphocarbolates (page 484). It is used as an antiseptic lotion in *gonorrhœa* and *leucorrhœa*, 2 grs. to 1 oz.

Zingiber is a powerful aromatic stimulant, acting like capsicum and cardamoms (which see); chewed, it is a valuable sialagogue; and used as snuff, it causes severe nasal irritation.

PART V.

NON-OFFICIAL REMEDIES.

In the last edition of this work, under the above heading, 60 pages were devoted to a brief description of the sources, actions, doses, &c., of many remedies not included in the late Pharmaeopœia. The writer is glad to find that the Pharmacopœia Committee, in their new excellent work, have included the most important and valuable of these. Nevertheless, many remedies remain—some of them in extensive use and some upon their trial—whose importance still necessitates a brief notice. The necessarily small space at the writer's disposal prevents his giving many valuable pharmaceutical details and therapeutical references which the student will find in the forthcoming edition of Mr. Martindale's and Dr. Westcott's most valuable Extra-Pharmacopœia.

Abrus Precatorius (Jequirity Seeds).

Since the scarlet seeds known as "prayer beads and jumble beads" were introduced by Wecker for producing what is now known as Jequirity Ophthalmia much has been written upon them. Sattler, using a ½ to 1 per cent. active *fresh* infusion prepared by macerating the bruised seeds deprived of their coats, in cold water for 24 hours, filtering and applying at once to the conjunctiva, describes the application itself as painless. After three hours—the period of incubation—symptoms of a severe ophthalmia begin, which reaches its height in about 30 hours. There is intense inflammation, pain, heat, redness, and œdema, with the development of a thick adherent croupous membrane, which separates from the

conjunctiva about the third day, but which is reproduced at intervals for 3 days more. There is profuse purulent secretion, and generally some weeks elapse before the last traces of redness, unevenness, and dirty yellow discoloration pass off. The inflammatory symptoms are much intensified by repetition of the application in the early stages.

Many observers have found the infusion swarming with a peculiar microzyme, to which they have attributed all the effects of the drug. This easily recognised bacillus has been seen in the purulent secretion, and Sattler affirms that a little of the secretion will produce a conjunctivitis like the original, only much milder. He cultivated the bacillus through several generations. Bechamp and Dujardin have recently cultivated the bacillus, and upon injecting it into the veins found that it produced death like jequirity. Much contradictory evidence has been produced in explanation of the inflammatory phenomena, but the careful researches of Klein may be at present accepted as proving that the jequirity ophthalmia is *not* the result of the action of the bacillus, which is undoubtedly present. He produced the typical ophthalmia by a sterilised infusion, devoid of the jequirity bacillus, and he completely deprived an infusion of its activity, though it was swarming with the microbe. The researches of Klein have been supported by those of Warden, Waddell, Neisser, Salamonsen, Dirknick, Holmfeld, and others. The natives of India, to procure the hides of cattle, make a paste of the ground seeds, shape it into arrow points, and when dry insert them under the skin of the animals, and cause their death in a few hours. The activity of the abrus appears to depend upon a chemical substance or ferment. It contains no alkaloid. Vennemann and Weinemann thought they were able to isolate this pepsin-like ferment.

Much difference of opinion exists also about the real value of jequirity in ophthalmic practice. The writer believes that this arises from the fact that too much has been said in praise of it by some, which has led to the disappointment of others who used the drug expecting impossible results. There can hardly be a doubt that it is a remedy of great value, that it is almost harmless when skilfully used, and that it will cure granular lids which resist every other treatment. Troitzky summarises his experience of the drug in 51 cases of *trachoma* :—"The lower transitory fold of the conjunctiva always becomes smooth after jequirity inflammation; in certain cases of *pannus* it restores a good condition of the cornea, and it is one of the most powerful remedies for *trachoma*." Shoemaker has used it in *lupus*, scrofulous, syphilitic, and indolent *ulcers*,

chronic syphilitic sores, &c., and reports favourably of it. He used a paste made by rubbing up the macerated seeds with four times as much water.

Achillea Millefolium.

This member of the *compositæ* was once very popular; recently Lvoff has been advocating its claims as a remedy for *leucorrhœa*, especially in young subjects, when administered as an infusion—3 drs. to 1 pint.

It has been found by Annenkoff to possess considerable influence over *hæmorrhoidal* and *uterine* hæmorrhage, *dysmenorrhœa*, and *leucorrhœa*, and as a stimulating tonic in *atonic dyspepsia*.

Chomel has found it to be an antispasmodic, and uses it in *amenorrhœa*.

Acid. Gynocardic. (See Chaulmoogra Oil.)

Acid. Hydrofluoricum.

The concentrated acid is a powerful caustic, destroying the tissues deeply, and producing a firm, painful, dry slough.

A very weak solution of hydrofluoric acid gas in water (1 in 600) has been administered with considerable success in *goitre*, in doses commencing with 1 scruple and gradually increased to 1 dram. Its mode of action is very uncertain.

The fumes of the acid given off by acting upon fluor spar in a leaden vessel with heated sulphuric acid have been inhaled in *diphtheria*, with a result which merits further trial. The acid so readily attacks glass, and its production is so inconvenient in the sick room, that it has been very seldom used.

Acid. Osmic.

This acid, which has been used in the preparation of microscopic specimens, and known as perosmic acid or tetroxide of osmium, has recently been found of real value in a variety of neurotic ailments by several very distinguished authorities. A hypodermic injection of 5 minims of a freshly prepared 1 per cent. solution into the tissues over the painful spots in the course of neuralgic nerves has been found to speedily cure the disease in patients who had tried nearly every other known remedy without effect. Bilroth found it to cure *sciatica* which had resisted treatment for years, when injected deeply between the ischium and trochanter. Occasionally it fails, but no ill effects have ever been noticed from its use. Mohr, Eulenberg, and Redtenbacher have likewise found marked

benefit from it in unpromising neuralgias of various regions. 15 minims may be injected, but the solution should be *freshly prepared*. It has been injected into *strumous glands* and *cancers*, but with questionable results. Recently Wildermuth has reported the results of two years' trial of the drug in many cases of *intractable epilepsy*. In some, marked amelioration of the symptoms occurred. He gave the aqueous solution, but found better results from $\frac{1}{64}$ gr. osmate of potassium in pill, 15 of which being the maximum daily allowance. No ill effects were noticed.

Acid. Picricum. (Trinitro-carbolic acid).

A yellow substance formed by slowly mixing carbolic with fuming nitric acid. It is commonly known as Picric or Carbazotic acid, and is used as a yellow dye. It has been recently introduced as a test for albumen in the urine, and a saturated solution of the acid in water is a most delicate test, throwing down a beautiful cloud, even when the albumen is in small quantity; about a dram of the saturated solution may be poured gently into a test tube half filled with urine, and allowed to float upon the surface. It is not necessary to add any acid before heating with this test, as it acidifies the urine sufficiently. It is used also as a test for sugar in the urine. By boiling the suspected liquid with picric acid and caustic potash, if glucose be present the yellow acid is converted into the red picramate of potassium, the depth of colour indicating the strength in sugar.

Recently the acid has been tried in *erysipelas*, apparently with some advantage. The saturated solution should be painted over the affected parts. Negative results have followed its administration as an anthelmintic, antiperiodic, or as a remedy for *trichinosis*.

Acid. Pyrogallicum. $C_6H_6O_3$.

The white feathery crystals which sublime upon heating gallic acid. It is a powerful antiseptic from its affinity for oxygen. Introduced by Jarisch in cutaneous affections, it has been found useful in the form of his ointment (1 dr. to 1 oz. of lard) when rubbed into the patches of *psoriasis*. It does not cause irritation of the skin, apparently spending its energies upon the diseased spots and leaving the healthy dermis unaltered. If applied, however, in concentrated form, it is a powerful local irritant, and has been used to cause the destruction of *epithelial cancers, chancres, lupus*, &c. It stains the skin and hair, dark.

One grain in solution every hour has been proved useful in *internal hæmorrhages*, and has been found not to derange the stomach or foul the tongue. Pyrogallic acid is a dangerous drug in large doses, and the daily dose should not exceed 15 grains. Coming in contact with the alkaline blood, it is changed into a toxic substance. Alarming symptoms have followed the application of the ointment, which should only be applied to limited surfaces. Vidal applies it in powder mixed with four times as much starch, and blown upon *phagadenic chancres*.

Acid. Sclerotic, or Acid. Sclerotinic.

As mentioned under Ergot—page 385—there are *several* active principles found in that drug. This acid is one of them; it is not, however, a pure substance, but consists mainly of Ergotinic Acid. It is doubtful if it will cause contraction of the uterus, and it is possible that the results attributed to its action have been caused by other principles of ergot which were incorporated with it, as Sphacelinic Acid.

Marckwald believes it has hæmostatic powers which entitle it to a good place in obstetrical and gynæcological practice. It may be given hypodermically in doses of $\frac{1}{2}$ gr. dissolved in 5 minims of water; the solution must be fresh. Better results will follow the use of the B.P. Ergotin.

Acid. Trichloroacetic.

Filippowitch has recently tested the properties of this new antiseptic. It is a crystalline body soluble in water, and when applied to the skin acts as a caustic. 1 per cent. solutions destroy nearly all forms of bacterial life without causing irritation of the skin, and have been found of great value as a dressing for *wounds*, *ulcers*, *venereal sores*, *erysipelas*, &c.

Internally, 2 to 5 grs. of the acid in dilute solution have produced very satisfactory results in *diarrhœa*, *gastric catarrh*, and *carcinoma of the stomach*. It is highly recommended as a preventative of *cholera*.

Adonis Vernalis.

This ranunculaceous plant resembles digitalis in its action; it contains a glucoside—adonidin—which appears to be identical with digitalin, and which has yielded good results in the hands of Bubnoff, though it possesses more irritant action upon the stomach and bowels.

It has been given in *cardiac dropsy*, where it has strengthened the ventricular contractions, reduced the frequency and in-

creased the strength of the pulse, and produced marked diuretic action. It is doubtless a remedy of great power, but it is doubtful if it will accomplish in failing compensation as good results as digitalis; and Nothnagel believes it should only be used where digitalis has been tried and failed. One tablespoonful of an infusion ($\frac{1}{4}$ oz. to 10 oz.) should be given every three hours.

Agaricus Albus. (White or Purging Agaric).

A fungus in large, whitish, spongy, friable, irregular pieces, obtained from the larch.

In doses of 15 grs. of the powder, or 3 grs. of the spirituous extract, or $\frac{1}{12}$ gr. agaricine (a white crystalline powder), it has a very decided action in checking the night sweats of *phthisis* It was formerly used as a purgative, and causes watery stools in large doses; in small doses it *checks diarrhœa* and *dysentery*, and is useful in *hæmoptysis*; it diminishes the secretion of the bronchi and mammæ.

The physiological and therapeutical action of agaricine was first realized by Murrell, who used it for the night sweating of phthisis. Recently Pribram, of Prague, has detailed his conclusions about its action, as recorded in the *Therapeutic Gazette* (May, 1885). He finds that (1) agaracine is a scarcely ever failing remedy for the suppression of excessive perspiration, especially in phthisical patients; (2) in the physiological state agaracine sustains perspiration at a certain constant level; (3) in cases of suppression of copious perspiration by agaracine, the cutaneous and pulmonary discharges remain essentially unaltered; (4) the urinary organs discharging the surplus of liquid, and the diminished thirst decreasing ingestion of liquids, the hydrostatic equilibrium is thus re-established; (5) moderate perspiration yields to a single $\frac{1}{6}$-grain dose, while profuse sweating requires repeated equal, or increasing doses for its suppression; (6) the physiological action of the drug manifests itself five hours after its exhibition; (7) there are no undesirable after-effects attending its use. (8) Agaraeine leads to improvement of the subjective state of phthisical patients by eliminating a constant drain on their flagging strength, without, of course, altering the pathological tissue changes themselves.

Allium. (Garlic.) U.S.P.

The volatile oil—Sulphide of Allyl—obtained from the clove of garlic is a powerful expectorant of the stimulating class, and markedly increases the bronchial secretion, and renders it

less difficult in being expelled. Garlic appears to act like the onion (see page 486) upon the bronchial mucous membrane during the process of excretion by this channel. It is valuable also as a rubefacient in *bronchitis*, and is a certain anthelmintic, killing the round worm. It is a powerful antiseptic, and in the concentrated form will produce vesication, purging, and vomiting. The oil is not given internally, owing to its irritant qualities, but the freshly expressed juice in 30 minim doses, or a tincture of the bulblets (1 to 5) in dessert-spoonful doses, will act as a valuable expectorant and diuretic ; ½ oz. of the syrup of the United States Pharmacopœia is the most agreeable and convenient form in which to get the virtues of this drug. It is a powerful antispasmodic and carminative, and may be given by the rectum.

Althæa. (Marsh-Mallow). U.S.P.

The root of this plant has been long recognised as a valuable demulcent and emollient, and enjoys great popularity in *bronchitis* and *catarrhs*, or, made into a fomentation (4 oz. of the dried herb to 1 pint), it has been used to prevent suppuration and to relieve pain and tension in the *inflamed mammary gland* and in various *acute joint affections*. An ointment made by boiling the chopped leaves in lard (1 to 1) and straining has been in use for a variety of skin affections. Recently Dr. Berry has found this ointment to cure an intractable case of *palmar psoriasis*.

Althein is a crystalline body identical with *Asparagin*, and may be obtained from the root of marsh-mallow and asparagus. It possesses diuretic qualities, and is, in medicinal doses (2 grains dissolved in 4 drams of water) a remedy in *cardiac dropsy*, *Bright's disease*, and *gout*, which has given results worth further trial.

Alum Ammonio-Ferric. (Iron Alum). U.S.P.

This pale violet-coloured salt is an ammonia iron-alum, in which ferric oxide replaces oxide of aluminium.

It possesses stronger astringent properties than ordinary alum, is more soluble and less irritating in small doses, and may be used where an unstimulating iron salt is indicated with a good astringent. It is in *hæmorrhage from the kidneys*, and especially in *intermittent hæmaturia*, that its virtues have been found to surpass those of other astringents ; 5 to 10 grs. given 4 times a day will be found to materially diminish the albumen in *Bright's disease* 1 dr. to 8 oz. water makes a good astringent gargle in relaxed and inflamed conditions of the throat.

Amaranthus Spinosa.

A shrub of India. The fresh root has been found by Deb to act as a mild diuretic and specific in *gonorrhœa*, in which disease it effects a speedy cure. As many as 5 or 6 roots may be daily chewed. The taste is not disagreeable. Shortly after administration painful erections, micturition, and discharge cease. Externally the powder has been applied to *eczema* with success. It is also laxative in doses of the weight of a rupee, to be chewed daily.

Anacardium. (Cashew Nut).

The oily liquid obtained from the pericarp of this nut has been held to be a cure for *leprosy*. Martindale states that it contains 90 per cent. of anacardic acid. Internally it has been given as an anthelmintic, but it is chiefly used as an external application to *ringworm* and *leprous ulcerations*. It has been seldom employed in this country.

Antipyrin. (Dimethyloxychinicine.)

An alkaloid discovered by Knorr and prepared synthetically, is a white powder, with a not unpleasant taste, soluble in half its weight of warm water. It belongs to the group of chinolin derivatives. Though only recently introduced, this remedy has been administered very many thousands of times, and already enough has been seen to prove that it possesses antipyretic virtues which place it above every drug hitherto used for the reduction of fever heat.

Its mode of action still remains to be demonstrated, and its utility in *curing* the diseases, in which it has successfully reduced the temperature is yet to be proved.

It should be given in doses of 30 grains every hour for two or three hours, and Filchene, who first investigated its action, found that the temperature falls gradually, often without sweating, and reaches its limits in 3 or 4 hours. It remains low for 7 or 8 hours and may not rise for 20 hours. The rise is not generally ushered in with shivering, as after Kairin. The pulse falls, but the respirations are not materially altered, while blood pressure is slightly increased. Before the temperature falls, dilatation of the cutaneous vessels has been observed. These observations have been verified by Guttman, Biermer, Ranke, and a great many others. It has been given in nearly every disease where a high temperature has been reached. Perhaps its best results have been seen in *typhus* and *typhoid*, *phthisis*, *erysipelas*, and *rheumatism*. It does not generally afford as great satisfaction in *pneumonia*, and

pleuritis. The observations of Argutinsky, Penzoldt, Sartorius, and others show that it is especially valuable in the treatment of the febrile diseases of children—one decigramme (1½ grs.) being given for each year of the child's age for three successive hourly doses, dissolved in half an ounce of sweetened peppermint water. For an adult 3 times the ordinary dose may be given by the rectum, or one ordinary dose (30 grs.) dissolved in half its weight of warm water may be injected hypodermically, or two half doses may be similarly injected with an interval of 1 hour. A fall of 3 to 5 degrees is a constant result, and even of 12 degrees has been recorded. Vomiting occasionally results; the urine is not darkened as after Kairin; sometimes profuse sweating occurs, which Von Noorden found could be always prevented by a small dose of atropine or agaraeine given before the administration without interfering in any way with the antipyretic effect of the drug. No serious result has followed the administration of antipyrin; in a few cases slight collapse was noticed. Mingazzini has recently found that kairin and antipyrin could be well administered together, the mixed drugs producing a much more marked fall of temperature than an equal quantity of either drug given separately, and the fall lasted longer.

The temperature should be taken very frequently, as the third dose, and occasionally the second dose, may not be necessary. As a rule 75 grs. will be sufficient for one day's allowance, but in *typhoid* fever double this amount and more has been given without inconvenience. A peculiar exanthematous or measley eruption has been the only untoward effect noticed besides the occasional vomiting; this latter is obviated by hypodermic administration. The drug is excreted by the urine. Jacubsky found that sometimes cough and dyspnœa increased in children under its use. The results of the observations of the innumerable physicians who have been trying antipyrin all go to show that it is a remedy of immense value, and almost free from danger.

Apiol. (From apiol petroselinum).

A green oily liquid, the active principle of common parsley. It is a powerful diuretic; in large doses (1 dram) it produces effects like quinine, ringing in the ears, headache, and vertigo. It was formerly used as an antipyretic. It has feeble antiperiodic powers, and is chiefly recommended in *dysmenorrhœa* and *amenorrhœa*, given immediately before the expected menstrual period, in capsules containing 3-5 minims. Its use is indicated in the class of cases said to be benefited by permanganate of potassium, *i.e.*, those, where without any obvious

reason the menstrual discharge disappears for one, two, or three times.

Arbutin.

The active principle of Uva Ursi is a glucoside introduced into medicine by Lewin. It is a remedy of considerable value, and should entirely replace the leaves from which it is obtained. The results of Lewin's experimental researches are published in the *Therapeutic Gazette*, September, 1883. He found that Arbutin when introduced into the system hypodermically or by the mouth was split up—Hydrochinon appearing in the urine, which becomes brown or olive green on exposure. Arbutin is not poisonous; the hydrochinon into which it decomposes is a powerful antiseptic and antiferment, even in 1 per cent. solutions. It exerts its therapeutic action in passing out of the system while the urine is collecting in the bladder. It has been proved to be of great benefit in *chronic cystitis* and *vesical catarrh arising from obstruction*, &c., and in *suppurative* conditions of any part of the *urinary tract*. It may be given in the form of powder in 15 to 20 gr. doses, to be taken in water, or half this quantity may be given hypodermically. Lewin's researches prove that if any benefits are to be obtained from Uva Ursi leaves they must be given in much larger doses —1 oz. made into an infusion—and the tannin contained in the infusion should be removed by agitating it with powdered vegetable charcoal.

Asclepias Incarnata. (White Indian Hemp.)

Dr. H. Frazer has found that in some cases where other well known diuretics had failed to give relief in *renal* and *cardiac dropsy* the liquid extract of this plant acted efficiently. It appears to possess the important advantage over squill, digitalis, broom, and other diuretics in not causing vomiting or gastric disturbance, and in not interfering with the bowels. It acts upon the heart, strengthening its beats as digitalis does. Dose of the fluid extract (1 in 1) ½ to 1 dram four times a day.

Asclepias Tuberosa. (Pleurisy Root.) U.S.P.

Is allied to the previous remedy. It produces in dram doses of the powdered root, diuretic effects, and is a good expectorant. In larger doses it is an active cathartic and emetic.

Aseptol or Sulpho-Carbol (Acid. Orthoxyphenyl Sulph.)

In the *Medical Record* of August, 1885, the conclusions of Annessens, of Antwerp, are recorded upon this substance.

After considerable experience of its virtues, he reports:—(1) Aseptol, differing from salicylic and carbolic acid, in every proportion readily dissolves in water, alcohol, and glycerine; (2) it is more acid, but at the same time less caustic, than carbolic acid; (3) it directly combines with bases, which salicylic and carbolic acid will never do; (4) it is perfectly harmless in use—consequently, not likely to cause accidents, like salicylic, carbolic, and boracic acid; (5) its antifermenting, antiputrid, and disinfectant properties are more energetic than those of salicylic and carbolic acid; (6) aseptol will advantageously replace carbolic acid as a prophylactic and disinfectant in times of epidemics, and as a curative remedy wherever carbolic acid is employed for hygienic purposes, and in medical, surgical, and obstetrical practice; (7) aseptol, for these properties, highly recommends itself to the use of public and private promoters of hygiene and salubrity.

Asparagin.

(See under Althæa, page 503.)

Aspidospermine.

Is an active principle of Quebracho Bark, which has been used in *cardiac asthma* and *dyspnœa* of various kinds. It is a powerful drug, but must be used with caution. Harnack and Hoffmann recently appear to have exhausted the subject of quebracho bark. They found it to contain six alkaloids, four of which are crystalline; the most active of these is quebrachine and the least active is aspidospermine. The aspidospermine of commerce appears to be a mixture of all these alkaloids. It is, however, advisable to employ a liquid preparation of the bark, owing to the difficulties in obtaining the alkaloids in a pure state. The greatest value of the bark, according to the above-mentioned authorities (*Medical Record*, May, 1885), consists in its property of reducing the irritability of the respiratory centre. It proves beneficial in relieving *dyspnœa* depending upon disorders of the circulation, or diseases of the heart. Da Costa has found benefit from 20 minim doses of the liquid extract every hour in the *asthma* arising from failure of cardiac contraction. Maragliano has likewise found benefit from it in similar cases. He noticed that the pulse was reduced 20 beats without any alteration in the arterial pressure. The mixture of alkaloids known as the commercial aspidospermine has been given in doses of $\frac{1}{3}$ to 1 gr., dissolved in water acidulated with sulphuric acid. Hydrochlorate of quebrachine has been given hypodermically and by mouth, in doses of 1 gr. It acts as an emetic, like apomorphine, speedily and energetically.

Auri et Sodii Chlor. (Chloride of Gold and Sodium.) U.S.P.

An orange-yellow deliqueseent powder, whieh has been found to give results in various nervous diseases superior to the salts of silver. Small doses ($\frac{1}{25}$ gr.) inerease the appetite and promote eonstruetive metamorphosis; larger doses, aeeording to Bartholow, inerease waste—the tissue yielding most readily being the *connective*, espeeially that of pathologieal formation—henee its usefulness in *sclerosis*, and he affirms it has eured *posterior spinal sclerosis* and *interstitial nephritis*. Results whieh appear to warrant eonfidenee in this drug have been obtained in *hystero-epilepsy*, *seæual debility*, nerve diseases eharaeterised by spasm, as *laryngismus*, *asthma*, *chorea*, &e., and in various ovarian and uterine affeetions. Dose, $\frac{1}{20}$ to $\frac{1}{10}$ gr., in pill or dissolved in water, twiee daily.

Azedarach. U.S.P.

The bark of the root of Melia azedaraeh is used as an anthelmintie to destroy asearides lumbrieoides. 1 oz. is boiled in 10 oz. of water to half its original bulk, and of this $\frac{1}{2}$ oz. is given every 2 hours till purging oeeurs. There are mueh more effeetual, pleasant, and safe vermifuges.

Baptisin (Baptisia Tinetoria.)

(One of the eeleetie remedies), is obtained from the wild indigo. In the form of powder—1-5 grs. in pill—it has been found to eause vomiting and purging. "It is an hepatie and intestinal stimulant of eonsiderable power." Has been useful in *amenorrhœa*, and in *low typhoid states*, and as a loeal stimulating alterative to *fetid gangrenous sores*.

Basham's Mixture. (Mist. Ferri et Amm. Aeet.) U.S.P.

Tineture of Chloride of Iron 2 parts, Diluted Aeetie Aeid 3 parts, Solution of Aeetate of Ammonium 20 parts, Elixir of Orange 10 parts, Syrup 15 parts, and water 50 parts. A valuable method by whieh the diuretie and astringent qualities of iron may be obtained. Dose—One tablespoonful thriee daily.

Benzin. (Petroleum Ether.) U.S.P.

A transparent eolourless diffusible liquid distilled from Ameriean petroleum. It has been used in 30 min. doses as an anthelmintie for *tape worm*, and as a remedy when mixed with lard or oil for the *itching of painful skin affections*.

Berberis Aquifolium. (Holly-leaved Barberry.)

The root of this plant has been extensively tried in Ameriea made into a tineture (1 to 5). It is said to be a powerful

alterative and tonic in 20 minim doses, and has been found useful in the various forms of *syphilis* and *struma*.

Bile Salts. (Taurocholate and Glycocholate of Sodium.)

These salts extracted from ox-bile have been used with success by Granville in *gouty obesity* and *dyspepsia*. In patients with inherited gout and a tendency to accumulation and deposition of fat in the omentum and elsewhere, coupled with a deficiency of production and maintenance of heat, pills containing 4 grains of the mixed salts rendered the stools characteristically rich in bile, without purging. The food was readily digested, and the accumulation of fat seemed to melt slowly away, being burned off as nutritive fuel in the system.

They appear to be a decided improvement upon the official Fel Bovinum Purificatum.

Bog-bean or Bogbane. (Menyanthes trifoliata.)

Drs. White and Pollock have drawn attention to this plant as a valuable remedy for *functional amenorrhœa*. It is largely used as a domestic remedy for various ailments by the peasants of the North of Ireland. Dose—2 drs. of the leaves in infusion, or ½ oz. of Martindale's liquid extract.

Boldoa Fragrans.

The leaves of the boldo tree, a native of Chili, are used as substitutes for quinine. Dose—10-20 minims of a tincture (1 to 8) in *dyspepsia*, *atony of the bladder*, and *rheumatism*.

Boroglyceride.

By heating together 46 parts of glycerine with 32 parts of boracic acid till the product ceases to lose weight, a semi-solid glacial substance is formed which has been patented under the name of "Boroglyceride." Some of its food-preserving and antiseptic properties are mentioned under Acid. Boric. (page 301). Valuable results have followed its use as an emollient application to *eczema* and many skin affections. Recently, in addition to its being extensively used as an antiseptic and surgical dressing, it has been mixed with an equal weight of glycerine, when it forms a honey-like liquid, which makes an elegant base with alkaloids, iodine, iodoform, carbolic acid, &c.

Turnbull finds a 50 per cent. solution a satisfactory remedy for *trachoma* and many *conjunctival affections*, brushed over the everted lids or dropped into the eye twice daily.

Bromal Hydras. (Hydrate of Bromal.)

Is an oily looking substance prepared like chloral hydrate by replacing the chlorine with bromine vapour. It is much more irritating than chloral, and more decidedly narcotic. It has a more dangerous depressing effect upon the heart, and causes great excitement before sleep supervenes. It should be used with caution. It has been recommended in *epilepsy*, but in *safe* doses it is useless. 5 grains is a full dose. Sometimes it relieves pain and produces sleep when other narcotics have failed.

Bromoform has been used as a general anæsthetic by Horroch, who has administered it to animals with satisfactory results. The anæsthesia is of long duration and not followed by any unpleasant after effects, especially vomiting. It causes, however, great irritation of the conjunctiva and respiratory passages, and is equally annoying to the administrator.

Brucia. (Brucine.)

An alkaloid in small whitish, bitter, acicular crystals, obtained from nux vomica. In physiological and therapeutic action it closely resembles strychnine (only it is considerably weaker, and is eliminated with much greater rapidity). It increases very markedly the reflex activity of the spinal centres; see nux vomica in the Therapeutic section of this work. It has been recommended in *epilepsy*, in doses beginning with $\frac{1}{30}$ grain, gradually increased to $\frac{1}{2}$ grain in solution in water and a little spirit.

Bryonia. (Bryony.) U.S.P.

The fresh and dried roots of *Bryonia alba* and *Bryonia dioïca* are used in medicine. The United States Pharmacopœia orders the recently dried root (2 oz. to 1 pint.) It is a hydragogue cathartic of considerable power, acting somewhat like jalap, and is given in *dropsies*. Bryonin, a bitter principle contained in it, appears to act as a tonic not unlike quassia. $\frac{1}{2}$ oz. of the tincture is a full dose.

Calcii Pentasulphidi Liquor.

This liquid is mentioned under Sulphur—page 486. It is not official, and hence is referred to here. It is by far the best remedy for *itch*, which it cures rapidly and completely. The writer has used it in numerous cases with unqualified success, and has been enabled to stamp out this troublesome disease in a large school in one day. It has only to be brushed over the skin or well soaked in with a sponge, and allowed to dry of

itself. The entire body may be so treated at bed-time and the patient put to bed, when the superfluous sulphuretted hydrogen will disinfect without soiling the bed clothes, or wearing garments.

Camphora Monobramata $C_{10}H_{15}BrO$. (Brominated, Monobromated, or Bromide of Camphor.)

A crystalline solid, or in long acicular crystals in which bromine replaces an atom of the hydrogen of camphor. In large doses it produces great muscular prostration, convulsions, reduction of temperature and pulse, slowing of the respiration, coma, and death. In medicinal doses (5 to 10 grs.) it has been used in *delirium tremens*, *epilepsy*, *hysteria*, *chorea*, *neuralgia*, *pertussis*, and *asthma;* not with sufficiently good results to warrant its use when other known available remedies are at hand. It is a hypnotic of no mean power. The drawbacks to its use are its irritative effect upon the stomach and the local irritation following after hypodermic injection.

It is best given in the form of pill, 5 grs. with 1 gr. Canada Balsam.

Camphora Carbolata.

An oily liquid, prepared by mixing 1 part of carbolic acid and 1 of alcohol, and adding $2\frac{1}{2}$ parts of camphor. A mixture of this with olive oil has been used successfully as a non-irritating *antiseptic dressing for wounds.*

Cannabin Tannas. (Tannate of Cannabine.)

A yellowish powder obtained from Indian hemp, and free from the poisonous volatile oils. It has been used in cases where Indian hemp was indicated, but it is uncertain and inconstant in its action. Dr. Fronmüller has found it "a useful hypnotic, powerful without being dangerous, and one which does not disturb the secretions or leave unpleasant toxic after effects if given in proper dose." Dose, 5 grs. in pill; for insomnia it may be increased to 10 or 20 grs.

Occasionally, good results have followed its administration in *acute mania.* Wood has recently experimented with a sample of this drug supplied by Merk; he gave it in 20 gr. doses, which only produced slight drowsiness.

Cannabinon.

Another alkaloid obtained from Indian hemp has been recently tried by Richter and others; though much more certain and powerful than the previous drug, it, too, occasion-

ally fails completely. Its use is indicated in *mania*, *hysteria*, and *sleeplessness* of various kinds. Dose, ½ to 5 grains.

Cannabinum Apocynum (Apocynum U.S.P.)

The root of American Indian hemp or Canadian hemp is in small doses a laxative, in larger doses a cathartic of the hydragogue class, and in larger doses a powerful emetic. It exerts an action upon the heart like digitalis, and is a reliable diuretic if the proper dose be administered. It is given with advantage in *dropsies of cardiac and renal origin*. Dose of a decoction (1 to 40) 1 to 2 oz., or of a tincture (2 oz. to 1 pint) 10 to 60 minims, or of the active principle—apocynin—as an expectorant, ¼ to ½ gr.

Cantharidin.

The active principle of cantharides is highly recommended as a means of using the drug for external use. It occurs in flat, glistening crystals; and Dietrich advocates the abandonment of all other preparations of cantharides for solutions of various strengths in formic acid, turpentine, oils, collodion, lard, &c. 1 in 300, or about 1 gr. in 5 drams, will cause vesication. It is a terrible poison, and should never be given internally.

Carbon Disulphide. U.S.P.

A solution of the strength of 4 minims in 1 pint of water of the bisulphide of carbon is a powerful antiseptic, destroying all bacterial life. It has been found useful as a dressing to *foul sores*, and as a spray in *diphtheria*, and an inhalation in *cholera* and *typhoid fever* when given internally at the same time. Considerable interest has been excited by the belief of some who think that exposure to the fumes of the liquid causes sexual paralysis in the workers in factories where the carbon bisulphide is made. Ckiandi-Bey, after 20 years' experience amongst workers in factories where the liquid is used, never saw a case. When the vapour is inhaled it produces *anæsthesia*, like chloroform, only the insensibility is shorter. Externally, the liquid is a painful irritant, and has been used as a counter irritant in *scrofulous adenitis*. The spray produces local anæsthesia like ether.

Carbonis Detergens Liquor.

Under the above name, a concentrated alcoholic solution of coal tar is well known and frequently prescribed. It contains all the active principles of tar, and affords by far the best means

of obtaining the virtues of tar in skin diseases. Under Pix, page 440, the uses of that drug are mentioned in *eczema*, especially the *scaly variety*, *psoriasis*, &c. This liquor will give much better results, and the writer has found it to act with surprising power upon *inveterate eczema*. Hutchinson recommends a lotion of 1 oz. Liq. Plumbi Subacet. and 7 oz. Liq. Carb. Deterg. A teaspoonful mixed with 10 oz. water, as a lotion, to be applied on lint to the parts at night, and covered with oiled silk, and the following ointment to be used in the day time. The liquor upon being added to water makes an emulsion, which is a powerful antiseptic, and can be used for all the various purposes to which tar is applied, viz., lotions for *foul wounds*, *putrid sore throat*, or taken internally in *bronchial affections*, *winter cough*, *hæmorrhoids*, &c.

℞. Liq. Carbonis Detergens
Liq. Plumbi Diacet. a. ℥t. xv.
Hydrarg. Ammon. Chlor. gr. x.
Vaseline ℥j. misce.
Fiat Unguentum.

Carbonis Tetrachloridum.

The vapour of this colourless mobile liquid will produce general anæsthesia, like chloroform, but its effects are very transitory, and it is seldom used except to relieve local pain and discomfort, as in *hay fever*, *asthma*, *tic*, &c., when the vapour may be inhaled with benefit. When applied over the seat of neuralgic nerves and pained joints it gives relief speedily. It is seldom given internally.

Carduus Mariæ. (Silybum Marianum.) (Lady's Thistle.)

An old remedy revived by Lesenevich, who found it very efficacious for *hæmoptysis* in 15 or 20 minim doses of the tincture of the seeds, in water every two hours. Recently Dr. Krasnikoff has obtained very satisfactory results with this remedy in *hæmoptysis* where digitalis and ergot had previously been given and failed.

Carlsbad Salt.

According to the researches of Harnack, this salt owes its therapeutic virtues entirely to the chloride, sulphate, and bicar-

bonate of sodium in its composition, and he accordingly gives the following form for its *artificial* preparation :—

Sodium Sulphate	100 parts.
Sodium Bicarbonate	80 parts.
Sodium Chloride...	40 parts.

Its action can be readily anticipated by a survey of its composition; it has been highly appreciated as a mild saline purgative in dessert-spoonful doses, dissolved in a tumblerful of water, in *constipation* associated with *diseases of the kidneys* and *liver*, and in *gout*, *rheumatism*, &c.

Cascara Amarga. (Honduras Bark.)

The bark of a Mexican tree of the order Simarubaceæ. It has been largely used in America as a remedy in *syphilis* and as an alterative in various *chronic skin affections*. Its advocates agree about its uselessness unless tobacco and alcohol be abstained from. Dose—½ dram of the fluid extract representing an equal weight of the bark.

Casca Bark (Erythrophlœum Guinense), or Sassy Bark.

Has been made the subject of a series of able experiments by Brunton and Pye. It closely resembles digitalis in its physiological effects. The dose is 10 minims of Dr. Brunton's tincture (2 oz. of the bark to 1 pint of rectified spirit).

Dr. Sansom has employed the tincture substitutively for digitalis in a considerable number of cases, but was unable to convince himself that it has any more beneficial effect in *mitral disease*. Brunton has found it useful in *dilated heart without valvular disease*, in *mitral disease*, and in *dropsy*.

The powder causes violent sneezing when inhaled, and Hartnack thinks the alkaloid acts like a combination of digitalin and picrotoxin. It disturbs the digestion more readily than digitalis. The student should not confound this drug with Cascara Sagrada Bark.

Caulophyllin.

An eclectic remedy prepared from the root of *Caulophyllum thalictroides* (U.S.P.), blue cohosh, or squaw root. It is a brownish powder, best given in form of pill, 1—4 grains, and is recommended as a diuretic, emmenagogue and parturient. It has been given with some success as an anthelmintic.

Cedron. (Simaba Cedron.)

The seeds of this tree have been long employed by the natives of New Granada as a febrifuge and antidote to *bites of venomous animals*. Is contains a bitter principle which appears

to have antiperiodic powers like quinine without its ill effects. The powdered seeds in 5 grain doses have been given in *ague*, *dysentery*, *cholera*, and *facial neuralgia*, and have recently been employed in *gout*. In small doses cedron is a tonic acting like the pure vegetable bitters, and is of use in *atonic dyspepsia*.

Chaulmoogra Oil.

The solid yellowish oil expressed from the seeds of *Gynocardia odorata*. Its active principle, Gynocardic acid, is the most convenient form for the administration or use of this drug. The oil has been used in India, and lately with some success in this country, as an external application with friction to the chest and abdomen in *phthisis*, *tabes mesenterica*, and *struma*. It has been also tried in a similar manner rubbed into the skin over joints the seat of chronic *rheumatism* and *rheumatic arthritis;* also with some advantage in very *chronic eczema*, *leprosy*, *lupus*, and *psoriasis*. The oil is so nauseous and bulky that its internal administration should be seldom used when Gynocardic acid is at hand.

Checken.

The leaves of Myrtus Chekken contain a volatile oil and a volatile alkaloid combined with an organic acid. They have been found by Murrell, Dessauer, Holmes, and others to possess valuable expectorant qualities. Tangeman has used the fluid extract (1 to 1), and finds that in its elimination by the bronchial and renal surfaces decided diuretic and expectorant action occurs. The actual contact alters the relaxed conditions of the vessels, and hence of the mucous membranes. He compares the action of chekken to that of eucalyptus. He found in *chronic catarrhs* that it gave tone to the relaxed mucous membrane and made the breathing freer, especially in the case of old people. He gave ½ to 1 dram of the fluid extract every 4 hours. It has been used in *diphtheria*, *laryngitis*, *dysentery*, and in *catarrhal conditions of the bladder*.

Chian Turpentine.

This substance, about which so much has been written, is the semi-solid oleo-resin, obtained by puncturing the trunk of *Pistacia Terebinthus*. It mainly derives its interest from the reports of its marvellous powers in the treatment of *cancer of the uterus* by Dr. Clay. The elaborate and closely watched trials of its use have resulted in the general belief in its absolute powerlessness over this terrible malady;

but it has been almost as clearly proven that it exerts some slight anodyne action which, by relieving pain, improves to some little extent the condition of the sufferers under the various forms of cancer. The spurious imitations of the drug, manufactured to meet the sudden demand upon it, have been generally wholly inert. Already the drug appears to be rapidly falling into the obscurity from which it so suddenly and undeservedly has been called.

It may be given in pills, 3 grs. of the turpentine combined with 2 of sulphur, 6 times a day.

Chinolinum. (Chinoline.)

An oily liquid derived from quinine or cinchonine and a constituent of coal tar. It is artificially prepared by heating nitro-benzine, aniline, and glycerol with strong sulphuric acid. This is a powerful antiseptic, and has been very extensively tried on the Continent in *typhus, pneumonia, diphtheria, enteric* and other *fevers*, with varying success, as an antipyretic. Sudeikin obtained good results in *intermittent fever*. Its smell, taste, and irritating qualities are barriers to its use, as it produces vomiting easily.

Siefert has obtained wonderful success with it painted upon the affected parts in *diphtheria* (5 per cent. solution in weak alcohol).

The Tartrate is the only salt for internal use. It is soluble, and may be given in doses of 5 to 20 grains in water. and has been useful in *ague* and *neuralgia*.

Chininum Amorphum Boricum.

Finkler and Prior have introduced this preparation of quinine. It is an amber-coloured crystalline powder, with a faint unobjectionable odour and bitter taste, and it is soluble in an equal quantity of water. Their results are reported in the May number of the *Medical Record*. They find that this preparation is much better borne than any other compound of quinine, even patients with irritable stomachs being able to take it without vomiting. Its action is equally satisfactory, having been administered with success in *typhus, typhoid, erysipelas, pneumonia, phthisis*, and with marked success in *neuralgia*. It causes less singing in the ears than quinine. Schuabach recommends it upon this account as less likely to cause congestion of the tympanic membrane. It is equal in its effects to the sulphate or hydrochlorate of quinine.

Chloroform Ammoniatum.

Dr. W. B. Richardson recommends, under the name of ammoniated chloroform, a mixture of equal quantities of strong

solution of ammonia in alcohol and chloroform. 2 drams put into an inhaler and breathed till chloroform narcosis is reached, may be inhaled without danger for a considerable period. In this way the temperature has been reduced 4° during 12 hours. It is thus antipyretic, anodyne, and anæsthetic, and maintains the alkalinity of the blood. He recommends its use in *acute rheumatism.*

Cocculus Indicus. (Menispermum Coeculus.)

The dried fruit of this plant is a powerful narcotic, and has been long used to catch fish and game, and to add to the intoxicating powers of porter.

Picrotoxin, its active principle, is a crystalline substance, sparingly soluble in water. Externally, an ointment (1 gr. to 1 dr.) kills *pediculi*, but it must be used with caution. Internally it is, in doses of a few grains, a powerful poison, irritating the respiratory and other centres in the medulla, and producing violent spasmodic muscular contractions from its stimulating action upon the cerebral and spinal motor centres. It has been used in *epilepsy*, especially in the nocturnal variety; in *paralysis* affecting the muscles of the pharynx, and in *sick headache.* It is, however, to check the *night-sweating of phthisis* that this drug has been much used, and good results have been obtained by Murrell, who first introduced it in this troublesome condition, in doses of $\frac{1}{200}$ to $\frac{1}{100}$ gr. three times a day.

It may be given in pills, and the dose increased to $\frac{1}{25}$ gr., or in solution with a little acetic acid; or hypodermically, $\frac{1}{30}$ gr. It is antagonistic to the action of chloral hydrate.

Cockroaches. (Blatta Orientalis).

These insects have been used by the Russian peasants for centuries as a remedy for dropsy. Their action has been made the subject of careful and laborious research by Bogomoloff, Fronmuller, and many others, with the result of proving that when given in the form of powder, infusion, or tincture they increase the quantity of urine, diminish the amount of albumen, and rapidly reduce anasarca and ascites. Tchernysheff, Sushtchinsky, and Loesch, experimenting with their active principles, found that their virtues depend upon blattic acid, which forms soluble salts with potassium and sodium. These salts were found to be powerful diuretics, acting by exciting the secretory elements of the kidney. They slow the pulse in small doses and accelerate it in large doses, and cause falling of the blood pressure and paralysis of the cardiac muscle.

Colchicine and Coniine.

The active prineiples of colchicum and conium, are suitable for hypodermic injection when the actions of these drugs are indicated, the former in $\frac{1}{32}$ gr. doses in *painful joint affections, chronic rheumatism*, and *gouty troubles;* the latter in $\frac{1}{2}$ minim doses in *acute mania.* (See in Therapeutic Section, under Colchicum and Conium.)

Colloid Styptic. (Richardson.)

Prepared by dissolving a saturated solution of tannin and gun cotton in absolute alcohol and ether and adding a few drops of tincture of benzoin.

The solution is a most valuable styptic applied to wounds with a brush or in the form of spray.

Convallaria Majalis. (Lily of the Valley.)

This well-known plant has been long in use by the peasants in Russia, who employ it in dropsies. It has been found to possess powers closely resembling digitalis, which it promises to replace to some extent, especially as those who have studied its action most, believe that it possesses none of the objectionable qualities which render digitalis sometimes so dangerous.

It has a very decided tonic influence in moderate doses over a weakened heart, and it is a powerful diuretic.

It contains two glucosides—one, *convallarin*, is a drastic purgative, in large doses; the other, *convallamarin*, is an emetic in even small doses. The most active preparation of the drug is an extract made from one part of the root and leaves, and three parts of the flowers and stalks; this may be given in 5 gr. doses, but the most uniform action is obtained from convallamarin, which is a whitish powder, and may be given in doses of $\frac{1}{3}$ to 2 grs.

One grain of the dried flowers, infused in 1 oz. water, and administered every four hours, is a convenient method for administration.

Troitzky has found that when given in cases of *mitral disease*, with cardiac failure, the most decidedly beneficial results follow; dyspnœa, irritability of temper, and palpitation disappear, and the action of the drug is maintained for a week after its use has been suspended. Under its use the pulse becomes more regular, fuller, and somewhat slower, the urine increases in amount, and dropsy diminishes, and continues to diminish for some days after the administration is stopped.

Ott believes it differs in its action from digitalis, by *primarily* increasing the frequency of the heart, and by afterwards slowing it, through its action on its muscular tissue.

Sansom is convinced of its power of raising the intravascular pressure, and of its increasing the force of systole, but is not yet convinced of its superiority to digitalis.

The recent experiences of Roberts, Labbee Hiller, Maragliano, and many others go to prove that different specimens of this drug are often very uncertain in their results, but all taken together tend to show that in convallaria, therapeutics has gained a very decided advantage by its introduction.

Coto Bark, and Paracoto Bark.

The *true* Coto bark resembles the *false* or Paracoto bark, but is much richer in resinous and extractive substances, and yields a more energetic alkaloid. Cotoin is the alkaloid of Coto bark, and Paracotoin of Paracoto bark. They are similar in action, but Cotoin is more powerful.

Albertoni has studied the action of these drugs exhaustively. He found they increased the appetite, and in a marked manner increased the absorptive power of the intestinal surface by dilating the intestinal vessels.

Cotoin has been successfully used in the treatment of various forms of *diarrhœa*. Rohrer found in 180 cases of diarrhœal disorders "that no remedy of those usually used in these affections offers such advantages as coto, more especially in the treatment of the *diarrhœa of children*." Good results have followed its use in the diarrhœa of *phthisis*, *teething*, *marasmus*, and *intestinal catarrh*, especially in the *feeble-minded* and *insane*, and in the *sweating* of phthisis, and it has been tried recently in *cholera*. It is not an astringent, and has but feeble antiseptic power, and Albertoni thinks it acts beneficially in *diarrhœa*, by increasing the intestinal absorption, the diminution of which is the cause of the diarrhœa. It is contra-indicated in hyperæmic states of the abdominal organs or in hæmorrhage from the bowel.

Dose of the bark, 5 grs.; of cotoin, ½ to 2 grs.; of paracotoin, 1 to 3 grs., 4 or 6 times a day.

Curara. Wourara. Urari. (The South American Arrow Poison.)

A dried extract, the product of various unknown plants. Strychnos and cocculus contribute to its terrible potency. Injected hypodermically or thrown direct into the blood stream, it produces profound muscular relaxation, with *slight* con-

tractions, and, if the dose be large enough, general muscular paralysis soon results and death follows from stoppage of the respiration. The heart's action persists to the end, and the nerve centres are unaffected, the action of the poison "being upon the *terminations* of the nerves, not on their central origin." The sensorium remains clear till almost the end. When given by the mouth, the kidneys are able to excrete it so rapidly that a large dose may produce no effect. It has been used subcutaneously in *chorea*, $\frac{1}{15}$ gr.; in *hydrophobia*, and in *tetanus*, apparently with occasional success; but the results of experiments on animals would lead us to conclude that at best it can only be regarded as a palliative; still, it must not be forgotten that it is honoured with the reputation of having already saved some lives in both *tetanus* and *hydrophobia*.

It is administered by hypodermic injection—$\frac{1}{4}$ to $\frac{1}{2}$ gr. dissolved in 4 to 8 minims of distilled water.

Cypripedium. Cypripedium Pubescens, and Parviflorum. U.S.P.

Known as Ladies' Slipper; the rhizomes of these orchidaceous plants have been found to possess antispasmodic and stimulating tonic properties, which have led to their administration in the group of diseases in which valerian has been found serviceable, *i.e.*, *hysteria*, *hypochondriasis*, &c. There is an eclectic preparation in the form of a brownish powder, given in doses of 1 to 5 grs. in pill.

Damiana.

This is the name given to a plant *(Turnera diffusa)* long used by the Mexicans as a powerful stimulant to the centres presiding over the reproductive functions. The leaves and flowers, with their young twigs, are the parts used in medicine as an aphrodisiac. It has been very extensively used in America as a remedy of considerable value in many forms of *brain exhaustion*, and want of tone in various regions of the nervous system, especially about the *genito-urinary organs*. It is a mild purgative, and has been given in some cases of *paralysis* with apparent benefit, and in *sick headaches*. The writer has obtained good results from it in cases of *sexual debility* and *hypochondriasis*.

Dose—1 oz. of an infusion representing $\frac{1}{2}$ to 1 dram of the leaves three times a day; or 1 dram of the fluid extract, which represents 1 dram of the plant. The infusion freshly prepared is a tonic; in its action upon the appetite and mucous membrane of the stomach it resembles quinine and calumba.

Daturia. (Daturine.)

An alkaloid obtained from stramonium and datura tatula.

The researches of Ladenburg may be said to have cleared up the chemistry of the alkaloids which dilate the pupil. He has proved the *identity of Daturine with Hyoscyamine and Duboisine*, and his results lead him to believe that there are but *two* mydriatic alkaloids, viz. (a) Atropine and (b) the alkaloid passing under either of the names—Hyoscyamine, Daturine, or Duboisine. These two bases are almost identical in their relations, and are isomeric, so that *practically* the physician may regard these four alkaloids as one and the same remedy. They all produce dilatation of the pupil, increase the pulse and respiration rate, and cause delirium. (See Belladonna and Hyoscyamine.)

Dose.—$\frac{1}{120}$ to $\frac{1}{60}$ gr., and may be increased to $\frac{1}{8}$ gr. in solution with a few drops of weak acid.

Datura Tatula.

A solanaceous plant, resembling in most respects stramonium, with which it appears to agree in physiological and therapeutic action. It has been introduced as a remedy for *asthma*, to be smoked like stramonium, and though it may not be generally found to be more certain than this plant in its usefulness, yet the writer has seen it give most unmistakable relief when stramonium had completely failed, after many trials; and in this case it *continued* to give relief for years.

Deelinæ Oleum. (Deelina Oil.)

This oil—manufactured, as its name implies, on the banks of the river Dee—is a very highly refined petroleum oil, and has been very extensively tested by Dr. John Roberts, of Chester, who has found it clean, inodorous, and not being easily made rancid. He has used it in a variety of skin diseases with results that would lead one to expect that it will soon become a favourite cutaneous remedy.

For *gouty eczema*, ordinary *chronic eczema*, and also for the *acute general* variety, Dr. Roberts obtained very satisfactory results. Particulars of 42 cases are recorded in the June number of the *Practitioner* treated by simple application of the oil generally after one warm bran or oatmeal bath. It is especially valuable as a soothing and curative application to eczema of the *anus*, *perinæum* and *labium*, *intertrigo*, *pityriasis capitis*, and *impetigo* of the scalp in children. It can be mixed with chloroform, oleate of zinc, &c., and can be made the basis for almost any other cutaneous remedy. Dr. Roberts advises

that it should not be applied till the acute symptoms have subsided.

Delphine. (The Alkaloid of Stavesacre.)

In ½ gr. doses in pill it has been given in *asthma*, *rheumatism*, &c., and externally applied in the form of ointment over the course of neuralgic nerves. See page 484, under Staphisagria in the Therapeutic Section.

Digitalin.

The Digitalinum of the late B.P. was wisely omitted from the 1885 volume. It was most variable, dangerous, and uncertain in its action. It is evident that it did not represent the active principle of the drug, since digitalis contains at least three active glucosides with different actions. The official or Galenical preparations should invariably be used in medicine, as the isolation of these active principles is as yet, even in the hands of the ablest chemists, surrounded with great difficulties. See Digitalis, page 381.

Duboisia Myoporoides.

An Australian solanaceous plant, yielding duboisine, an alkaloid first investigated by Tweedy and Murrell, who found it to resemble atropine closely in its physiological effects. Later research has proved it to be *isomeric* with that body, and to be *identical* with daturine and hyoscyamine. It is used in ophthalmic surgery as a substitute for atropine, which it resembles in every respect. It is said to act more promptly, and not to require so strong a solution. 1 or 2 grs. of the sulphate to 1 oz. distilled water, or an aqueous solution of the extract may be used. (See Hyoscyamine and Belladonna.) It may be given in *mania*, like the other mydriatics, in $\frac{1}{40}$ gr. doses.

Easton's Syrup.

Syrupus Ferri Phosphatis c. Quinina et Strychnina is a valuable tonic, and possesses the virtues of the various ingredients contained in it in a presentable form. According to Squire, each dram should contain about 1 gr. phosphate of iron and 1 gr. phosphate of quinine and $\frac{1}{32}$ gr. phosphate of strychnine. The experiments of Messrs. Davis and Schmidt show that the commercial article fluctuates very much in strength. The dose is one fluid dram.

Emetia. (Emetine.)

A yellowish-white alkaloid, obtained from ipecacuanha. It is a powerful poison in large doses; in small doses, $\frac{1}{4}$ gr., it produces vomiting, whether injected into the subcutaneous tissue or swallowed. It does not act so speedily when injected. In either case it is eliminated by the liver, and gastro-intestinal tract. It causes vomiting through reflex action, by irritating the *endings* of the pneumogastric nerve in the stomach when swallowed or injected. It also to some extent acts indirectly by stimulating the centre which presides over the act of vomiting. The internal temperature is raised, while the thermometer falls in the axilla under its use. (See Ipecacuanha, page 408, and the results of Rossbach's experiments demonstrating its expectorant action, on page 409.)

Dose as an expectorant, $\frac{1}{120}$ to $\frac{1}{40}$ gr.; as an emetic, $\frac{1}{8}$ to $\frac{1}{4}$ gr.

Eriodyction Californicum. (Yerba Santa, Holy Balm.)

The leaves of this hydrophyllaceous shrub have been extensively tried in America, and found to achieve some success in the treatment of *bronchial* and *laryngeal inflammations*. They contain an alterative mucilaginous principle which acts as a tonic to relaxed mucous membranes. How it acts, and what are the exact conditions in which success is to be expected, are as yet unknown. It was introduced by Dr. Bundy, who found it had been in use among the Spaniards of the Pacific coast for many years as an expectorant.

1 dram of the fluid extract, which represents an equal weight of the leaves, is a fair dose. A corresponding quantity of an infusion (1 oz. to 1 pint) may be given. It has the remarkable power of disguising many disagreeable medicines, like quinine, &c.

Erythrophlœum. (Sassy or Casca Bark), which see, page 514.

The active principle of this bark has been isolated by Harnack, Gallois, and Hardy. It is designated Erythrophleine, and closely resembles Digitaline, and in some respects Picrotoxine in its action.

Eserine or Physostigmine

Is one of the active principles of the Calabar bean; it is used in ophthalmic practice to contract the pupil and diminish intra-ocular tension. It is now official, and the reader will find its properties discussed under Physostigma in the Therapeutic Section, page 438.

Ether Hydrobromic, and Hydriodic. (See under Ethyl.)

Ether Oxalic.

This colourless liquid, prepared by the action of oxalic acid on absolute alcohol, is introduced to the notice of the profession by Dr. Richardson. It is decomposed when administered hypodermically, at the point where it is introduced into the system, where it coagulates the albuminous tissues, and produces with very little pain a dry eschar, without giving rise to constitutional disturbance. He regards oxalic ether not as an ordinary caustic, but as a destroyer of tissue, and recommends its application by the brush or injected with a hypodermic syringe, to destroy vascular growths.

Ethidene Dichloride.

This anæsthetic, which closely resembles chloroform in its physical characters, has been highly recommended by Snow, and has been made the subject of very careful experiments by a committee appointed by the British Medical Association. They report that it is more dangerous than ether, but less so than chloroform. It is more pleasant than chloroform and much less exciting in the early and after stages, and recovery from its influence is more rapid than in the case of ether or chloroform. The vapour of about ½ oz. will, generally speaking, be found enough to produce anæsthesia in the adult.

Ethyl Bromide (or Hydrobromic Ether.)

A liquid obtained by the action of sulphuric acid and alcohol on bromine, or by distilling a mixture of phosphorus, alcohol, and bromine. It has been extensively tried in America, where it was introduced by Turnbull and Lewis, as an anæsthetic, especially in ophthalmic practice; its action upon the heart and respiration is the same as that of chloroform; it differs from this substance, however, in the *rapidity* of its action (2 or 3 minutes) and the *promptness* with which patients come from under its influence; it has, however, the drawback of being more irritating to some patients. It is of course impossible to contrast its freedom from danger with that of ether and chloroform, as it has been used but seldom compared with the enormous employment of these agents; however, it certainly cannot be said to be less dangerous than chloroform, from the trials already made, and it must be still less free from danger than ether. It is not inflammable, and is valuable for its *local* anæsthetic effect, which can be produced by simple contact with a little of the liquid on lint, covered or not with

oiled silk. It has also been administered internally as an antispasmodic in various *convulsive affections*. The vapour of 1 dram will produce general anæsthesia.

Ethyl Iodide. (Hydriodic Ether.)

A liquid prepared in the same way as ethyl bromide, by substituting iodine for bromine. It has been tried with success in *cardiac dyspnœa* and in *spasmodic affections* of the *larynx* and *bronchial tubes*, and has been highly recommended as an inhalation in *bronchitis*, and *catarrhal laryngitis*, causing dyspnœa. It is a powerful expectorant, and often gives instant relief in *asthma*, by cutting short the attack in a few moments. It should be used like nitrite of amyl, and can be had in glass capsules, 5 min. in each, as recommended by Martindale. It affords the best method of saturating the system rapidly with iodine, upon which substance the activity and efficacy of its action depends; 3 or 4 capsules may be used at once.

Euonymin.

An eclectic remedy, in the form of a powder of variable brown or sage colour, obtained from the bark of *wahoo* (Euonymus atropurpureus, U.S.P.). It possesses aperient, diuretic, and expectorant properties, and acts as a powerful hepatic stimulant, and has proved beneficial in habitual *constipation, torpidity of the liver*, and in some cases of *dropsy*. It resembles podophyllin, but is much less stimulating to the intestinal glands. Conil has found that its action as a cathartic depends upon its stimulating action on the muscular coats of the intestine. It has been recently found to at first increase and afterwards diminish the amount of uric acid excreted. Romm, who has recently studied the pharmacology of the pure crystalline glucoside, has found that it produces effects closely resembling digitalis, reducing the frequency of the pulse, and strengthening the force of the ventricular contraction. He points out a remarkable effect which he has observed in cats from its administration: thus, the slowing of the pulse after a full dose may last for more than a fortnight. 2 to 5 grs. will cause generally a copious intestinal evacuation.

Eupatorium Perfoliatum. U.S.P. (Boneset.)

This composite plant is a valuable bitter tonic, like calumba, but it possesses most marked diaphoretic properties. The warm infusion (1 oz. to 1 pint) in wineglassful doses every two hours produces copious sweating; in 4 times this quantity it is an

emetie, like warm chamomile infusion, and also a purgative, It has been used to act upon the skin in *bronchial catarrh*, *influenza*, and *rheumatism*, and its cathartic action has been utilised for the expulsion of the *tape* and *round worm*.

Euphorbium Pilulifera.

Since the antispasmodic effects of this pill-bearing spurge were first brought before the profession in the *Therapeutic Gazette* a few years ago, the drug has been examined, experimented with, and administered by a number of workers.

Recently, Marsset found that in small doses it killed animals by paralysing the respiration and heart, through its direct action on the respiratory and cardiac centres. He publishes excellent results obtained with it in the dyspnœa of *asthma*, *emphysema*, and *bronchitis*, its good results depending upon a particular modification of the functions of the pneumogastric. Tison and Beaumetz obtained very satisfactory results from it in *dyspnœa of cardiac origin*. It appears to act beneficially upon *spasmodic dyspnœa* from whatever cause arising, and it unquestionably is a remedy of great power and promise. The gastric irritation arising from its administration can be avoided by giving the dose in a state of free dilution.

1 gr. of the extract or 4 to 6 grs. of the dried plant in decoction should be given 4 times a day, freely diluted, after meals.

Fellow's Syrup of the Hypophosphites.

This valuable compound presents the virtues of the hypophosphites of iron, quinine, strychnine, sodium, and manganese in the most elegant and efficient form. According to the analysis of Tscheppe in the Year Book of Pharmacy, 1884, the following formula yields a product in every respect similar to the original:—Soluble Phosphate or Pyrophosphate of Iron (U.S.P.) 15 grs.; Hypophosphite of Sodium, 45 grs.; Sulphate of Quinine, 5 grs.; Strychnine (previously dissolved) ½ gr.; Hypophosphite or Sulphate of Manganese, 15 grs.; thick Syrup to 16 ozs. The dose is 1 fluid dram freely diluted. The original syrup is always uniform, and does not decompose or crystallise.

Friedrichshall Water.

This valuable aperient mineral water gives better results than any other as a constant saline purgative. Under the heading of Magnesii Sulphas, page 418, its action and uses are explained. The *Practitioner* of June, 1885, in a note upon this remedy, states—"There are fashions in medicines as in other things, and this water, which was formerly a favourite,

seems likely to become so again, although it has been for some time thrown into the shade by other purgative waters containing much sulphate of magnesium and sodium. Frerichs, however, observed long ago that where it is desired to produce more or less fluid purging, the sulphate of magnesium bitter waters are of permanent usefulness, but that their continuous use is to be regarded with some distrust, inasmuch as the prolonged use of these waters is apt to affect the process of digestion. But when the water contains large quantities of sodium chloride in addition to the sulphates, as the Friedrichshall Water does, the chloride renders the effect milder and less exhausting, even after prolonged use, and consequently more permanent. Mosler and Von Mering by physiological experiments, and Seegen and Sir Henry Thompson by prolonged clinical experience, have independently arrived at similar conclusions.

The therapeutic range of Friedrichshall is highly esteemed by the leading German physicians; Mosler and Thierfelder find it of great service in habitual constipation and various digestive liver affections; Scanzoni in the constipation of pregnant women; Schröder and Veit in uterine congestions and inflammation, and especially in chronic metritis; Weber in catarrh of the bladder; and Sir Henry Thompson in the prevention of calculous disease and the prophylactic treatment of gravel. Lösehner, Helft, and Mosler, speak highly of its use combined with suitable exercise and diet in the torpid forms of struma, and in scrofulous children. The opinion of these authorities is likely to give a turn to the fashion again and reinstate Friedrichshall as a favourite laxative."

Since the above, Turnbull in the *Therapeutic Gazette*, August, 1885, speaks in the highest possible manner about the benefits he has received from the use of Friedrichshall Water in diseases of the ear, throat, and chest.

Fuchsine. (Roscine or Magenta.)

Brilliant metallic crystals of hydrochlorate of rosaniline. It was first recommended by Bouchut as a remedy for *albuminuria* with *œdema*. He found in several cases of disease of the renal organs, in which albumen appeared in the urine, that fuchsine possessed the remarkable power of diminishing or entirely arresting its appearance. In all his cases the albumen completely disappeared, the urine becoming stained rosy pink; his patients were children, and the dose varied from 1 to 3 grs. These remarkable results have, to some extent, been corroborated by other observers on the Continent, and by Dr. Sawyer at home. It is best given in form of pill.

with a vegetable extract like liquorice or gentian, in doses beginning with 1 grain. The solution in water is convenient, but it stains the lips and mouth red. The writer has tried this remedy in a variety of cases, and could not satisfy himself that it had any effect upon the quantity of albumen.

Fucus Vesiculosus. (Bladder Sea-weed.)

This well-known "wraek" at one time enjoyed a position in the Irish Pharmacopœia. Its virtues have been chiefly found useful in *scrofula*, various *glandular* and *joint enlargements*, and *bronchocele*. Professor Duchesne-Duparc used it in *psoriasis*, and discovered its remarkable power in producing the *absorption of adipose tissue*. Its pharmaeology has yet to be worked out; some believe it causes emaciation by the amount of iodides which it contains, but iodine or iodides will not produce the results claimed for this weed; others believe it to be uncertain or powerless, and it is a rather significant fact that the pig, which is regarded by some as closely allied to man in some physiological and structural points, has been fattened for market on the fucus vesiculosus in the North of Ireland. An extract has been sold as a remedy for obesity under the title of "Anti-fat;"

Dose—5 grs. of the solid alcoholic extract, increased to 30 grs.; or a wine glassful of an infusion of 4 ozs. of the weed to 1 pint of boiling water, or 1 to 3 drs. of the fluid extract.

Fuller's Earth.

A clay or native silicate of alumina, containing minute quantities of iron. In the form of impalpable powder, it is a valuable emollient and "drying" remedy in *weeping eczema*, and especially in the *intertrigo* of infants. It resembles the oxide of zinc in its properties.

Galium Aparine. (Cleavers.)

This succulent annual plant has been a domestic remedy for various *strumous disorders*, in which it has been swallowed as a decoction; and the juice has been applied to disperse *glandular growths*. Prof. Quinlan has recently brought under the notice of the profession a new action which it possesses. He finds by making a poultice of the chopped stalks and applying it to *chronic ulcers* "it acts as a slight stimulant and powerful promoter of healthy granulation." Ulcers of a chronic and hopeless class in his hands healed readily and satisfactorily. Dr. Boyce testifies to its value as a palliative in *cancer*. He gives 5 oz. of the juice daily, and applies a strong ointment to

the ulcerated surface, which he afterwards covers over with a dressing of the bruised leaves. In a very short time a more healthy action appears to set in in the ulcerated region.

Gaultheriæ Oleum. (Oil of Winter-green.) U.S.P.

The fragrant oil distilled from Gaultheria consists of salicylate of methyl to the extent of over 90 per cent. Its physiological action has been studied by Dr. Able, who found small doses to accelerate the pulse, whilst large doses seriously depressed it and paralysed the motor and sensory centres and respiration. It has been administered as an antipyretic in *acute rheumatism*, in which disease its effects closely resemble those of the salicylate of sodium. Its main usefulness lies in its being a source from which to obtain salicylic acid, and it is still a disputed point whether the acid derived from it is more efficacious than the artificial acid. The writer has administered both alternately and in many ways to test this point, and he is satisfied that where the *artificial* acid or its salts fail the natural acid and its salts will also fail. Externally, diluted with equal parts of olive oil or soap liniment, it is an excellent topical anodyne application to inflamed and painful rheumatic joints. Summing up the results of the treatment of 90 cases of rheumatism in the Belle View Hospital with the oil, Dr. Seelye says :—"It has all the valuable properties of salicylic acid, to which it is closely allied. Its action is more prompt and efficient in obstinate cases ; it has a more agreeable taste ; relapses under its use are less frequent ; the unpleasant effects of overdosing are no greater, and it is less depressing. Cardiac complications are no more frequent. It is important not to substitute the oil of birch (which it resembles closely) or a diluted article for it. Large and frequent doses are necessary to get the best effects (10 minims in water and glycerine every 2 hours). It is an efficient palliative remedy in *chronic* and *irregular forms of rheumatism*. It is a local anodyne to *inflamed joints*."

Gelatine.

Pick, of Prague, has introduced a new method of treating various affections of the skin, which has been advocated by Thin. He dissolves clean white commercial gelatine in double its weight of water on a water bath. The resulting solution brushed over the skin forms a protective coating, and has been used by Pick to form a basis for the application of chrysarobin, naphthol, iodoform, pyrogallic acid, and other active ingredients. Thus, for *psoriasis*, about 35 grs. of chrysarobin are added to 1 oz. of the hot gelatine solution, and stirred till

thoroughly mixed. This when cold makes a cake which can be afterwards melted and applied with a brush to the diseased spots. Auspitz uses a solution of gutta-percha in chloroform in a similar way. See under Traumaticine.

Geranium. (Cranesbill) U.S.P.

The rhizome of this plant is an astringent, owing to the amount of gallic and tannic acids contained in it. It has been prized in America as a mild unirritating astringent in the *diarrhœas* of *children* and *infants*. It can be used for all the purposes for which rhatany is employed, *i.e.*, as a local application in *anal* and *throat inflammations*, &c. It has been used with advantage as an injection in *leucorrhœa* and *gonorrhœa*. The dose of the U.S.P. liquid extract (1 in 1) is ½ to 1 dram three or four times a day.

Gossypii Radicis Cortex. U.S.P.

Cotton-root Bark is the bark of the root of Gossypium herbaceum and other species. It has been extensively used in America as a substitute for ergot in gynæcological practice. Prochownick, who recommends a fresh infusion in preference to the liquid extract (1 to 1), has employed it in *uterine hæmorrhage after abortion*, or the result of *fibroid tumours*. He administers 1 dr. of the bark infused in 5 ozs. boiling water for 8 minutes, during the first and second stages of labour in cases where ergot is indicated. He believes he has witnessed uterine fibroids diminish in size under its use. It is a perfectly safe drug, though not so rapid or reliable in its action as ergot ; 1 to 2 teaspoonful doses of the liquid extract may be given.

Grindelia. U.S.P.

The leaves and flowering tops of Grindelia robusta have been used in America with great advantage for spasmodic affections of the *respiratory passages*, chiefly for *asthma* and *whooping cough*, and results of a most satisfactory nature have followed when other remedies had been tried in vain; but occasionally, like all drugs used in asthma, grindelia has sometimes failed, nevertheless it is a remedy of great value. It has a balsamic odour and persistent acrid taste, and the decoction is an expectorant. In large doses it has a sedative action on the respiratory centre, while it stimulates the brain and cord, in larger doses still, it produces sleep and incomplete paralysis of the limbs. The oleo-resin which it contains is excreted by the kidney, and in its passage out acts as a

diuretic. The volatile oil is excreted by the bronchial membrane, and hence the action of the drug in *bronchitis*, *emphysema*, *bronchorrhœa*, &c. It has been found to control *cystitis* and *iritis* in full doses, and its local application as an injection in *leucorrhœa* and *urethritis*, and as a dressing for *burns* and *ulcers*, has been praised. It is used also as a *local antidote* to the poison of rhus toxicodendon.

Dose—Of the fluid alcoholic extract (1 in 1), 10 to 30 minims in asthma, and repeated every hour or every half hour ; for a child 2 years old in whooping-cough, 5 minims.

Dose—Of the pilular extract, 1 to 3 grs., in bronchitis.

Grindelia squarrosa (an allied species) has been found to possess decided anti-periodic properties that have led to its use in *neuralgia*, and especially in *ague*, *enlarged spleen*, and various forms of *chronic malaria*.

Guarana. U.S.P.

A dried paste, in hard sticks or subglobular cakes, prepared from the crushed or ground seeds of Paullinia sorbilis, a climbing, shrubby vine from Brazil. The alkaloid, of which it contains about 5 per cent., is identical with caffeine and theine, and is useful in *sick headache* in similar doses—1–5 grs. (See Caffeine, page 343.)

Gurjun Balsam. (Balsam Dipterocarpi, or Wood Oil.)

This balsam has been used in India as a substitute for copaiba, to which it bears a strong resemblance, but it is inferior in every respect as a diuretic. Good results have, however, followed its use in *leprosy*, when used as a local application, and given internally in 2 dram doses at the same time. Its local application (1 to 6 of lime water) is a good remedy in *chronic eczema*.

Hæmoglobin.

In a recent number of the *Deutsche Medizinal Zeitung* the great utility and value of this physiological remedy is referred to, and there can be little doubt that the advantages claimed for it by Ziemssen will be sustained by further experience. The hæmoglobin is extracted from pure blood obtained from the ox, and is administered in the form of a large pill or bolus coated over with chocolate and weighing over half a dram. Two such pills are given three times a day, and are so easily assimilated and so absolutely free from insoluble or irritating ingredients that they have already given good results in *chlorosis* and in various forms of *anæmia*, though the actual

amount of iron in each pill is perhaps not more than $\frac{1}{45}$ of a grain.

Vachetta has strongly urged the use of another salt of iron, *i.e.*, the Albuminate, for which he claims somewhat similar advantages. He administers it in grave cases of *anæmia* in doses of 5 to 15 grains every 6 or 8 hours, and has obtained striking results by injecting a 10 or 20 per cent. aqueous solution hypodermically, or into the peritoneal cavity, no evil effects ever following its use, the hæmoglobin of the blood is rapidly increased, and the hæmopoietic organs are stimulated.

Hamemelis. (Witch Hazel.)

The leaves of *H. Virginica* are official in the Pharmacopœia of the United States. They contain a bitter principle, but no alkaloid has been isolated, the active constituent being probably a volatile oil. The bark possesses similar properties.

Witch hazel bark has long been used by the Indians of North America as an astringent, and since its introduction to medicine has been found to be an astringent and styptic of considerable power. In *epistaxis*, *hæmatemesis*, *hæmoptysis*, *hæmaturia*, *menorrhagia*, and especially in *hæmorrhage from piles*, it has checked bleeding when other remedies failed. In what way it effects these satisfactory results is by no means certain, as it is not rich in the ordinary astringent principles —tannin, &c. It acts both locally and constitutionally, but it is chiefly for its local action that it is most used. A liquid prepared by mixing 1 part of the tincture (bark 2 oz., proof spirit 1 pint) with 20 of water makes a lotion for *wounds* and *ulcers*, or an injection for bleeding or ulcerated *piles*, which can be easily retained. It also is beneficial in *gonorrhœa*, *leucorrhœa*, &c. In all cases it is wise to administer it internally as well, in 5 minim doses 3 or 4 times a day. There is an extractive known as Hamamelin, the dose of which is about 1 gr. in pill, and Burrows, Welcome & Co. have introduced an elegant distilled liquid extract, the dose of which is about $\frac{1}{2}$ dram; it is known as Hazeline. Hamemelis is not toxic, and no very definite action upon the vascular system can be demonstrated by experiment. Dujardin-Beaumetz believes it has a specific effect upon the muscular fibres of the coating of the veins. It has been recently extolled as a remedy in dysmenorrhœa, relieving pain and languor and producing a comfortable feeling of exhilaration. Brunton found it in some cases of *hæmoptysis* to be more efficient than either ergot or digitalis. The writer has used it very extensively as a local application to varicoceles and varicose veins with a considerable amount of success, and as an enema (1 oz. Hazeline) in bleeding hæmorrhoids.

A suppository containing a grain of the extractive or an equivalent of 10 to 20 minims of the tincture (evaporated), or an ointment of 1 to 8 of the tincture, is very good treatment for painful, ulcerated, or bleeding *hæmorrhoids*.

Hedeoma. (Pennyroyal.) U.S.P.

The leaves and tops of Hedeoma pulegioides yield a volatile oil which has long been a domestic antispasmodic and carminative, like the oil of peppermint. It has a decided stimulating action upon the uterine functions, and has been for a long time administered to increase the scanty menstrual discharge or to establish the absent flow in *amenorrhœa* not depending upon organic disease. 5-10 minims will be found to be a full dose, and generally will produce marked *emmenagogue* action.

Helenin

Is the active principle of Inula Campana, or Inula Helenium (Elecampane). It has been of late tried by Valenzuela, Korab, and others, and found to be a remedy of considerable power in *phthisis*, *broncho-pneumonia*, *pertussis*, and *enteric affections*. The former observer states that it is a more powerful antiseptic than boracic, salicylic, or carbolic acids, and is unirritating. He used an injection (1 in 1,500) in cases of septicemia from *retained placenta*, "with horrible fetor," with striking results. In *ozæna* and *anthrax* it was equally satisfactory. Internally, when given in chest affections, it diminishes thoracic pain, cough, and purulent expectoration, which latter becomes gelatinous. There are no symptoms of narcotism, and the appetite improves and feverishness is reduced. In the General Hospital at Madrid it has been very extensively employed, and with marked success, in the early stages of *tuberculosis*. Ferran has pronounced its action upon the *cholera bacillus* to be more destructive than any other agent. It has been given by Baeza in the *diarrhœa of infancy*, in doses of $\frac{1}{12}$ gr. in water, with syrup and mucilage, and to adults in doses of $\frac{1}{2}$ to 2 grs. It promises, from the Spanish accounts of its use, to become one of our most valuable therapeutic weapons.

Hoangnan.

Under this name the Strychnos gautheria belonging to the Loganiaceæ has been long known to the natives of Tonquin as an alleged remedy for, and preventative against *hydrophobia*. It has been lately administered for these purposes in

America, France, and Germany, but no definite results have been published, though the drug has attached to it more than ordinary interest. The bark is used made into pills with alum and realgar, and 2½ grs. of it is administered in a spoonful of vinegar as soon as the symptoms of hydrophobia show themselves, and 1½ grs. are afterwards given every 15 minutes till the full physiological action of the drug is manifested. This is known by spasmodic contraction of the muscles of the legs, hands, and feet, and nervous twitchings about the chin. Preventative treatment consists in 1½ gr. of the bark given during the day after the innoculation with the poison of rabies, double this the second day, treble the third day, and so on till the physiological symptoms show themselves.

Homatropine

Is one of a series of artificial alkaloids produced by the action of dilute hydrochloric acid on salts of tropeine. It produces mydriatic effects, weaker, and in some respects preferable to those produced by atropine; thus, a (4 grs. to 1 oz.) solution of the hydrobromate of homatropine will paralyse accommodation—the paralysis will entirely disappear inside 24 hours; the dilatation of the pupil disappears generally within 48 hours, whilst the effects of atropine do not pass off for several days, during which the patient is unable to use his eyes. It has been used internally where atropine appeared to be indicated, but with results much less satisfactory than when applied to the conjunctiva.

Hopein.

It is announced in *Der Fortschritt* (June 20, 1885) that Williamson and Springmuel have at last thoroughly succeeded in isolating what has long been believed to exist—the narcotic alkaloid of hops. In the *Medical Record* (August 15) will be found a *resumé* of their experiments with different kinds of hops. It was found that English and German hops contained this narcotic principle in quantities too minute for isolation. The wild American hop was, however, found to contain it in sufficient proportions to permit of a quantity being obtained for physiological investigation. Large quantities of these were boiled under high pressure with a pure, slightly acidified solution of grape sugar. The resulting liquid was filtered through asbestos and condensed in a vacuum at a low temperature, and the alkaloid was then extracted from it. It is needless to say that little has been since determined of its pharmacological action, but enough has been made out to show that it is almost as powerful as morphine, without any of its objectionable

after-consequences, and soon the results of the further examinations will be made known.

Hydrastis Canadensis. (Golden Seal.) U.S.P.

The rhizome and rootlets of this plant have been found to possess stomachic tonic properties of an unmistakable value, and it has been used to take the place of alcohol in convalescence from prolonged drinking associated with catarrhal inflammation of the stomach. Its physiological action has been studied by Bartholow, who finds it to be an excito-motor closely resembling strychnine, and, though less powerful, its effects are of longer duration. It is mildly aperient, and slightly stimulates the liver, and is hence useful in *chronic constipation*, and appears to exert some alterative action upon the mucous membrane of the alimentary canal and urinary tract during its excretion, which has led to its successful use in *hæmorrhoids*, *gonorrhœa*, *ulcerations*, and *prolapsus of the anus*, *leucorrhœa*, &c., in which cases its internal administration should be always supplemented by local applications. Schatz has reported striking results obtained in gynæcological practice from the use of Hydrastis. He finds it to act like ergot, only more beneficially, in *uterine hæmorrhage* and in cases of *myoma*.

Dose—Of the powdered root, 30 grs., infused in 1 oz. boiling water, or 10 to 20 minims of the fluid extract.

Dose—Of the white crystalline alkaloid **Hydrastine**—1 to 4 grs. in pill, or 2 to 8 grs. of the yellow eclectic preparation, *Hydrastin;* or ½ to 1 dram of the tincture (root 2 oz. to 1 pint proof spirit) in 1 oz. water. Bartholow uses 1 dram of the alkaloid in 4 oz. mucilage as an injection in *gonorrhœa*, and Phillips recommends 2 drams of the tincture to 1 pint of water for the same purpose. This latter may be used as a local application to *chapped nipples*, *stomatitis*, *otorrhœa*, *ozæna*, and *foul excoriations*.

Hydrargyrum Formidatum.

The formamide of mercury was introduced by Liebreich as an anti-syphilitic remedy. He believes it undergoes disintegration in the blood after hypodermic injection, mercury being set free. It does not precipitate albumen or cause any irritation of the subcutaneous connective tissue. Scarenzio prefers the hypodermic administration of calomel in suspension, and Shoemaker injects $\frac{1}{10}$ gr. of the pure perchloride deeply into the tissues. It is claimed for the calomel that only 4 injections of 40 centigrammes in all is enough for ordinary cases of syphilis. The experience of all who have

used mercury much, tends to prove that many months, and even years, must be spent before the poison of syphilis is eradicated by this or any other drug.

Kopp and Schmitt have tried the formamide with satisfaction. From half to a whole Pravaz syringeful of a 1 per cent. aqueous solution is injected two or three times a day.

Hydrargyrum Tannicum Oxydulatum.

This preparation—introduced by Lustgarden as a remedy in syphilis—is a tannate of the protoxide of mercury, and contains 50 per cent. of the metal. It is a green tasteless powder, which decomposes upon the addition of weak alkalies, setting free mercurial globules, and it is believed that such a decomposition takes place in the bowels, and the minute particles of mercury find their way into the blood. One decigramme ($1\frac{1}{2}$ grs.) is administered 3 times a day. Kaposi has used it with benefit in many cases of syphilis. It does not produce any unpleasant after-consequences or disarrangement of the digestion.

Hydrangea Arborescens.

Dr. Edson has obtained good results from 1 dr. doses of the fluid extract of this plant in a case of *renal calculus* where the patient fainted from pain. The urine contained pus and blood. The remedy was first used about half a century ago amongst the Cherokees, and further experience of it is required.

Hydrocotyle Asiatica. (Asiatic Pennywort.)

The leaves of this plant have been largely used for *leprosy* in the East, and at home it has been considered a remedy of some power in *chronic syphilis and struma* in pills containing 4 grs. each of the powdered leaves—2, three times a day.

Hydrochinon or Hydroquinone. $C_6H_6O_2$.

This diatomic phenol is a derivative of coal tar, and is isomeric with resorein, and has been found by Brieger and Seifert to possess properties not inferior to quinine. It occurs in sweet, colourless crystals, and has been given in *typhoid* and *typhus fevers* and many other diseases where a high temperature has been recorded. Rostoshinsky finds it invariably reduces the fever temperature rapidly, a gramme dose causing a fall of 6 or more degrees. Its effects are more evanescent than quinine or antipyrin, a smart rigor generally issuing in, a rise in 4 or 5 hours again. The respiration and pulse are lowered, and perspiration occurs. It is safe, and does not pro-

duce buzzing in the ears, headache, &c., and it can be given continuously in 10 to 15 gr. doses.

Hydrogen Peroxide. (Hydroxyl.)

A solution prepared by treating peroxide of barium with hydrochloric acid. It has been administered as a disinfectant and alterative, like iodine, in *glandular swellings* on theoretical grounds, in *pertussis*, *scarlatina*, *diabetes*, *albuminuria*, and *fevers*, as an *antidote* to the alkaloids, and in *dyspnœa* and *rheumatism*, but with little results to encourage its use. Its local application to *purulent wounds*, *chancres*, and *sores* is attended with marked benefit. It is a powerful antiseptic and antiferment, destroying organised ferments with great avidity without having any effect upon diastase fermentations, and as a surgical dressing probably will win its way to a high place ultimately. A 12 per cent. solution has recently been proved to be of peculiar value as a disinfecting application, applied to the middle ear to check chronic suppurative inflammations. It is the basis of the disinfectant known as Sanitas.

Dose—$\frac{1}{2}$ to 2 drs., largely diluted with water.

Hygrinic Ether.

The exact composition of this body is not clearly made out. It is a derivative of hygrine, according to Calmels, and its isolation and discovery have only been recently announced by Panas, who found that the cocaine obtained as a second extraction from the leaves of the cocoa caused a wide dilatation of the pupil. Further investigation resulted in the finding of this new mydriatic, which causes no anæsthesia, and whose dilating effects pass off much quicker than those of atropine; they generally only last 24 hours.

Hyoscyamia. (Hyoseyamine.)

An alkaloid of hyoseyamus. It is identical with daturine and duboisine, and closely resembles atropine, with which it is isomeric. It is in *acute mania* that these alkaloids have been used with greatest success, and *amorphous* hyoseyamine, in doses of $\frac{1}{6}$ to $\frac{2}{3}$, or 1 gr., may be given by the mouth or hypodermically.

Seguin has found great benefit from hyoseyamine in *paralysis agitans* and *chronic chorea*, and the following is Murrell's summary of his experience of the drug:—1. It is a mydriatic. 2. In small doses it reduces the cardiac pulsations and increases arterial tension. It may cause a fall of temperature or create a rash. It often gives rise to hallucinations and de-

lirium. 3. In large doses it increases the pulse rate, produees partial paralysis, and induces sleep. 4. It is indicated in mania, restlessness, delusions of persecution, dementia with agitation and destruetiveness, epileptie mania, insomnia, ehorea, paralysis agitans, hysterieal spasms, tremor, neuralgia, &c. 5. In mania and allied states, it induces sleep with great eertainty. 6. In the status epilepticus it shortens the attaek materially. 7. It is a diuretie. 8. Its eurative power is not great, and in most spasmodic diseases it is only a palliative. Dr. Seguin suggests that in eases of very aeute ehorea, where death is threatened by incessant motion, hyoseyamine may prove of benefit by seeuring muscular relaxation with eertainty, thus allowing the patient to rest, and giving time for other remedies to aet.

Professor H. C. Wood has reeently studied the aetion of this substance. He points out the probable ease of the diserepaneies noticed in the reports of various observers, by showing that there are two distinet substances—Hyoseyamine, which is not erystallised ; and a mueh more active and pure erystalline alkaloid to which the name **Hyoscine,** as pointed out by Ladenburg, is given. Merek's erystallised hydrobromate, or hydriodate, in the original paekages, are the only salts which ean be relied upon, and the dose is $\frac{1}{100}$ gr., hypodermieally or by the mouth. He finds it to have decided hypnotie powers. with a spinal sedative aetion, and a feeble depressant effeet upon the eireulation and freedom from unpleasant after results. It has given very satisfaetory results in *aeute mania, delirium tremens,* and *pertussis.* It has little real anodyne or pain-relieving powers, but is a pure hypnotie.

Ichthyol.

Is a tarry looking semi-solid substanee with a gaseous odour, eontaining about 10 per cent. of sulphur, obtained by distillation from a bituminous roek in the Tyrol, whieh has been regarded geologically as being formed by deeomposed animal matters, chiefly from fish. Unna, of Hamburg, from a consideration of its tar-like nature and riehness in sulphur introdueed it to the profession as a remedy for various *chronic skin diseases.* He obtained good results in *psoriasis* with it, and found that it was impossible almost to produee irritation by its application, even if covered with oiled silk. It mixes with lard, vaseline, and oils, and is soluble in a mixture of ether and rectified spirit. Dr. A. Sinelair has used it with a fair amount of suecess in several cases of *inveterate eczema.* He found, in the case of an infant, that an applieation of 1 part of ichthyol with 5 of vaseline was followed within two

hours by a deep stupor, which lasted twelve hours, the patient ultimately recovering. This case should serve as a caution against the reckless use of a drug which promises to be of considerable value.

Ingluvin.

A powder prepared from the gizzard of the common fowl. This substance was introduced as a variety of pepsin to supplement the action of the gastric juice in *atonic dyspepsia* and conditions of the stomach where the natural pepsin was deficient. It has been proved that ingluvin exerts a very feeble digestive action upon albuminous foods outside the body, nevertheless, unmistakably good results have been achieved by the administration of this substance in some stomach troubles. It is in the vomiting of *pregnancy* that it has earned for itself some reputation. It has been found more efficacious in the vomiting of *primiparæ*, especially if associated with anæmia; it should be given very early in the morning, and repeated every 4 hours in 10 to 20 gr. doses. It has been found useful by Dr. Dobbs in the *dyspepsia* and *flatulence* of *phthisis*.

Iodized Phenol.

A dark thick liquid, or semi-solid paste, prepared by rubbing at a gentle heat, iodine 1 oz. and pure carbolic acid 4 oz. till dissolved. It is a caustic and powerful alterative when applied to *uterine ulcerations*, and is the best local treatment for abrasions and granular conditions of the cervix. The writer has found it seldom to fail in preventing *buboes* when lightly painted over the inflamed glands. It is used with success for *ringworm* of the scalp and body.

Iodated Phenol.—Under this name Rosenfeld has used a solution of 4 grs. of iodine and 8 grs. carbolic acid in 10 drs. of glycerine. Of this mixture 1 to 2 teaspoonfuls are administered to children in 5 oz. of water as an enema in *dysentery*, three or four times a day, with very good results. In one epidemic 176 cases were treated with the remedy, and only 6 died.

When mixed in the proper proportions carbolic acid has the power of bleaching iodine completely, and the resulting colourless liquid possesses all the virtues of both substances, and can be applied where iodine was decidedly objectionable.

Ipomæa Cærulea.

Has been used for its stimulating action upon the intestinal glandular apparatus. An extract prepared from the seeds in

5 to 10 gr. doses produces a copious, prompt, and painless evacuation, not liable to be followed by further purgation or astringency.

Iris. (Blue Flag.) U.S.P.

The rhizome and rootlets of *Iris versicolor* yield a fluid extract, and eclectic preparation, in the form of a brown powder. This latter preparation, known as Iridin, is the one generally used. It acts as a powerful hepatic and intestinal stimulant, and closely resembles podophyllin in its effects. It is believed to possess alterative properties, which has given it a reputation as an antisyphilitic and antiscorbutic. It is a diuretic, and has been found to remove *jaundice of malarial origin*. 1½ to 3 grs. every night in the form of a pill, followed by a mild saline, have given good results in the *vomiting of pregnancy*.

Dose—In ordinary *bilious attacks* 2 to 5 grs. in pill.

Jacaranda Lancifoliata.

This plant has been used as a remedy for *venereal* diseases amongst the natives of Columbia, and Mr. Mennell has tried it with considerable success in *gonorrhœa* and *gleet*, which had resisted other treatments. He gave 15 minim doses of the tincture (2 oz. to 1 pint ?) and in obstinate gleet injected 10 minims to 1 oz. water, which stopped the discharge in a short time.

Kairin. (Hydrochlorate of Oxyethyl-Chinoline Hydride.)

This powerful antipyretic was introduced by Filehene; it is a chinoline derivative. It is a white crystalline powder, with an unpleasant stinging and nauseous taste. In 8 gr. doses every hour or half hour it has seldom failed to reduce the temperature in a marked and surprising manner. Its disagreeable taste and unpleasant after effects have told against it, especially since the introduction of Antipyrin, before which drug it seems to be rapidly giving way.

It produces copious sweating, and appears in the urine, which it stains a deep green colour. Morokhovez has studied the physiological action of kairin, and finds it makes the arterial blood a dark brown and causes it to coagulate readily; the corpuscles are altered in shape, and the spectroscope reveals methæmoglobin; the heart becomes dilated through atony of the cardiac muscle. Unfortunately several cases are already reported where dangerous collapse followed its use, and some deaths have been attributed to its administration.

It has been given in nearly every disease where a high temperature has been recorded. The temperature must be taken every half hour, and when a fall to 100° is observed its use should be suspended, as a further fall is sure to occur, and the rise which occurs, generally issued in with a rigor, can be anticipated by a further dose some hours later on. The pulse and respirations are reduced, and the kidneys do not seem to be affected. The drug should be only given when moderately *fresh*, as the dangerous symptoms have been attributed to changes which had occurred in specimens through age. It should not cause any of the unpleasant effects of quinine, as ringing in the ears, &c., and it should be given freely diluted, and copious drafts of water assist its action. (See Antipyrin, page 504.)

Kaolin.

Is native white silicate of alumina, the product of decomposition of felspar and quartz. It is a pearly white powder, and acts as a protective application when applied to *weeping eczema, intertrigo, prurigo, impetigo*, &c. It is chemically inert, and is unacted upon by the majority of reagents, and hence has been used as a pill excipient by Martindale for permanganate of potassium, nitrate of silver, &c.

Kava Kava.

The root of *Piper Methisticum* has been attracting considerable attention. Kava was prepared from it by masticating the root for some time in the mouth, adding water to the fibrous pulp resulting from the chewing, and straining—(Yangona brewing). It is now generally prepared by simply pounding or grating the root. After a moderate dose the effect appears to be something like that produced by a large dose of caffeine—a sharpening of the mental faculties and a feeling of freedom from fatigue.

It acts upon the cord, and causes, after being very freely partaken of, an ataxic gait, the intellect remaining bright. Dr. Kesteven (Fiji) reports that it possesses the valuable and marked property of acting as an alterative upon the genito-urinary organs. He has found *chronic gleet* and *obstinate cystitis* readily yield to its powers. It is a decidedly stimulating diuretic (Brunton), and Mr. Kendall has found it to reduce the acidity of the urine.

Kola Nut. (Sterculia Acuminata).

This nut has been used by the natives of Central Africa as a substitute for tea and coffee, and various marvellous virtues

have been attributed to it. Heckel, Sehlagdenhausen, and Monnet have investigated its composition and action, and find that it contains large quantities of an alkaloid identical with caffeine. Monnet found it produced insomnia, was an aphrodisiae, stimulant to the cerebrum, restrained tissue waste. was diurctic and had powerful cardiae tonic properties, and controlled diarrhœa and acted as a general tonic.

Dose—1 dr. of a tincture (1 of the nut to 5) or 2 grs. of the aleoholie extraet.

Koumiss.

A palatable effervescing liquid, prepared by exciting fermentative changes in the milk of the cow, or mare.

Sakovich recommends its preparation from the milk of the cow in the following manner :—He rubs up 1 pint of a mixture of the fresh, unskimmed morning milk from the cow, and cold water (equal parts) with 15 grs. of German yeast in a mortar. To this 1 oz. of finely powdered white sugar is added, and the mixture is poured into a champagne bottle and exposed for 24 hours in a warm place (a little over 60°F.) After this it is carefully corked and tied down, and placed in a cool cellar for five days, after which time it is ready for use.

In this condition the casein is *partially* digested by the fermentation, which causes the sugar to be changed into lactic acid, which acts in its turn upon the casein. This precipitation of the casein by the acid relieves the stomach of some of its work.

Ponomaroff has used the cow koumiss with infants successfully. He mixed one glassful of unskimmed milk with 2 of water, added one teaspoonful of sugar of milk, and 2 of sugar and one and a half of beer yeast, and corked all up in a champagne bottle, and shook it frequently. At the ordinary temperature of the room the koumiss was ready in forty-eight hours, and contained $\frac{1}{2}$ per cent. of aleohol.

Koumiss is undoubtedly one of the most easily assimilated and nutritious of foods and remedies. It is invaluable in the treatment of all *wasting lung diseases*, in which cases it may be taken *ad libitum*. The weight of the body soon markedly increases under its use, and it will be appreciated when cod-liver oil cannot be tolerated. In various forms of *dyspepsia*, and especially in the *diarrhœa of children*, its use is attended with great benefit. In the protracted convalescence after *fever*, *kidney disease*, &c., and in many forms of *chronic vomiting*, it may be tried with every prospect of success.

The great drawback to the use of koumiss has been its expensiveness and the difficulty of procuring it fresh when required.

Dose—5 to 10 oz., three or four times a day, or oftener.

Kefir.—Under this name has recently been introduced a new fermented milk, which has been used by the natives of the plains near the Caucasus as a remedy for *anæmia*, *struma*, *chest affections*, and *gastric troubles*. It is like koumiss, and is prepared from the milk of the cow or mare by adding a remarkable and powerful ferment, the source of which is scrupulously kept secret.

Dose—Same as Koumiss.

Lappa. (Burdock.) U.S.P.

The root of Lappa Officinalis has been used in America as an alterative; it possesses diuretic properties, and appears to have more deserving claims as a remedy in the class of diseases for which sarsaparilla is vaunted. It has certainly some power over *chronic scaly skin affections*. A tincture made by percolating 4 ozs. of the powdered *fruit* with 15 ozs. of spirit and 5 ozs. water has been used with success in teaspoonful doses in *psoriasis inveterata*, where the palms and nails are badly affected.

Leptandra. (Culver's Root.) U.S.P.

The eclectic preparation from *Veronica*, or *L. virginica*, in the form of a brownish green powder, resembling podophyllin, is the one generally used in medicine. It stimulates mildly the liver, and acts as an intestinal tonic and stimulant or irritant, and has been used in *diarrhœa* and *dysentery*, and as an adjuvant to podophyllin.

Dose, in pill, 1-3 grs.

Licoperdon Giganteum. (Puff-ball.)

This common fungus, belonging to the natural order Trichogastres, which is found in abundance in woods and hill districts, has been long known to possess hæmostatic properties. It has been lately re-introduced into medicine by Dr. E. Thompson, and will be found a most valuable addition to therapeutics. He finds that it forms a soft and comfortable *surgical dressing*, in addition to its hæmostatic properties. The mature plant, which is about the size of a fœtal head, is employed. On breaking the outer skin, the dusty mass, consisting of the capillitium and spores, is the portion used. The writer has seen it used in *formidable hæmorrhages*, dusted over the bleeding surface, and plugged into deep and tortuous wounds where the open vessels could not be reached with a ligature, and the rapid and effective manner in which it

arrested bleeding was most surprising. He has seen it immediately arrest copious hæmorrhages, which he believes could not have been controlled by any other hæmostatic. How it acts is unknown. It would appear not unreasonable to hope that its internal administration in *hæmatemesis* and *hæmorrhage* in *typhoid fever* might be followed with good results.

Hagen's experiments upon the coagulation of blood have led some to suppose that the puff-ball acts by permitting the blood to deposit hæmato-blasts within its meshes, which thus become adhesive points for the subsequent attachments of particles of fibrin. The almost magical rapidity of the action of this blood-stauncher seems hardly explicable to the writer on this hypothesis. The objectionable fetor that results after the application of puff-ball to wounds may be a serious barrier to its usefulness.

This fungus has been known to produce poisonous symptoms when eaten raw, but it is harmless and agreeable to eat when cooked.

Malti Extractum. (Extract of Malt or Byne.) U.S.P.

Contains the active principle—diastase—a digestive ferment possessing the property, even when exceedingly diluted, of changing starch into sugar, like the ptyalin of the saliva. Its efficacy depends entirely upon the amount of diastase present, which, in many of the syrupy extracts to be met with, is very trifling. It is useful in cases where the digestive process is weak, and the assimilation of starchy foods is imperfect. It is a restorative, and is regarded as of more value than cod liver oil by some. It may be given in doses ranging from a teaspoonful to a tablespoonful in milk, wine, beer, porridge, tea, or cod liver oil after meals. Its high nutritive value renders it an agent of great utility in *phthisis*, *scrofula*, *rickets*, and many *wasting diseases*. It is a good plan to mix it with the food before being swallowed in *dyspepsia*, and wherever the digestive functions seem to be seriously impaired. It will not act in acid fluids, and consequently is of most value when given at a time when the acidity of the stomach is least. Combined with cod liver oil, malt extract is of great value, and the writer has obtained most gratifying results with Burroughs, Wellcome & Co.'s preparation in wasting pulmonary disease.

Manaca. (Vegetable Mercury.)

The root, with portions of the attached stem covered with bark, of the scrophulariaceous plant *(Franciscea Uniflora)*

has been long used by the Indians as a remedy for *rheumatism* and *syphilis*. Recent experience of its use in America has shown that it has very decided action in *sub-acute* and *chronic rheumatism*. Its virtues have been vaunted in *scrofula* and a host of ailments, in which it will probably be found to possess little or no powers. It appears to be a diuretic and emmenagogue.

Dose—20 to 60 minims, or even 2 drs., of the fluid extract (1 to 1) or 10 grs. of the powdered bark.

Mango. *(Magnifera Indica.)*

Used by the Indians as a masticatory, is an astringent with special tonic action upon mucous membranes, and has been highly recommended in *hæmorrhages* and *muco-purulent discharges* from the uterus, intestines, and bronchi. A liquid extract (1 in 1) made from the leaves and stems may be taken in doses of 5 to 10 minims every two or three hours in water. It does not disarrange the digestive organs, and is pleasant in taste.

Menispermin. (Yellow Parilla.)

The eelectic extract, in the form of a brownish powder, containing the active principle of *Menispermum Canadense* (Canadian Moonseed), U.S.P., and *M. fenestratum*. It is a weak intestinal stimulant, and possesses no power over the liver. It is, however, a valuable tonic, and has been given in *dyspepsia* and as an alterative remedy in *constipation*, 2-5 grs. in pill.

Methylic Alcohol. (Pyroxylie Spirit, or Wood Naphtha.)

Is a limpid, colourless liquid, a product of the destructive distillation of wood. It has been used as a remedy for *phthisis*, and Neligan and others found great benefit from it in this disease. It has a powerful influence over the hacking cough, and relieves the distressing vomiting of the latter stages of tubereulosis. It appears to act as a sedative to the respiratory centre. Its unpleasant odour is a great barrier to its use. It may be given in doses of 10 minims in peppermint water and syrup. Spirit of wine mixed with 10 per cent. of this substance constitutes **Methylated Spirit**, which can be used for *liniments* and *lotions* wherever ordinary alcohol is indicated.

Methylene Bichloride.

Introduced by Richardson as an anæsthetic; it resembles chloroform and ether in its properties. It is prepared by

aeting upon chloroform with nascent hydrogen. Morgan claims for it to be (1) *safer*, (2) *more rapid*, (3) *more manageable*, (4) *more easily recovered from* than chloroform. Two minutes suffice to establish anæsthesia, and about two drams are enough inhaled, like chloroform. It has been given 1,800 times by him without a death, but several fatal cases have been reported in other hands, notwithstanding that the drug has been little used compared with ether and chloroform. It destroys life by paralysing the heart. It is found by ovariotomists to be more manageable than either chloroform or ether, and consequently it is much used in the operation of removing the ovaries. Tenneson has obtained very satisfactory results with Methyl Chloride as a local anæsthetie, the spray producing in a few seconds immediate and uninterrupted relief in *sciatiea*, *rheumatie pains*, &c.

Mistletoe.

Viscum Album has been used in America and in this country as a remedy possessing qualities similar to digitalis, and beneficial results have followed its use in *heart affections* and *dropsies*. It has been found that this drug possesses also strong eebolic aetion, which promises to give it a plaee amongst our emmenagogue remedies.

Dose—5 to 30 minims of a tineture (1 to 8 of spirit).

Muscarin.

The active principle of poisonous fungi; is obtained from *Amanita* or *Agaricus muscaria*—Fly agaric—and ean be prepared synthetically. It resembles pilocarpine elosely in its aetion, thus it causes profuse salivation, perspiration, laehrymation, and gives rise to rather foreible and painful micturition; sometimes to nausea and diarrhœa.

When applied in solution (10 per cent.) to the eye, it dilates, and when swallowed it contracts, the pupil.

It is administered in the form of a hypodermic injection of $\frac{1}{4}$ to $\frac{3}{4}$ gr. of the nitrate in 5 minims of water, and has been given in smaller doses by the mouth with success for the *night sweats* of phthisis.

Muscarin is, with the exception of the local mydriatic and anhydrotic effects, a deeided antagonistie to every aetion of atropine. Atropine, then, is the antidote in eases of poisoning with fungi.

Naphthalin. $C_{10}H_8$.

In white erystals, obtained by the distillation of coal tar; and it is formed in quantity during the process of gas making.

It is a powerful destroyer of all forms of minute life, and a valuable aseptic and antiseptic for the treatment of *wounds*.

It is innocuous to man and the higher animals, and Lücke, who introduced it at Strasburg, used it very extensively in the form of fine powder to indolent *ulcers*, *sloughing wounds*, *open cancers*, and *chancres*, as well as to *fresh wounds* and *stumps*, and for disinfecting cavities. Dovoltchikoff, Jatzuta, Lindenbaum, Diakonoff, and many others have used this remedy as a surgical dressing to *wounds* and ulcers with great satisfaction. It is cheap, clean, disinfecting, produces rapid growth of granulations and cicatrices, diminishes irritability and pain, and its application is very simple and easy. The first-mentioned authority recommends the remedy in fine pure powder, to be dusted over the ulcers twice daily, covered with oiled silk, and bandaged.

Rossbach has expressed himself in the highest terms of Naphthalin as an intestinal disinfectant. He finds that it is so difficult of solution that it can be administered in doses fatal to all minute organisms in the intestinal tube from mouth to anus without doing the patient any harm, as it is not absorbed. He recommends it in *typhoid fever*, *diarrhœa*, and *dysentery*, and it has been loudly praised as a remedy of great promise in *cholera*. Upon the authority of Rossbach the drug has been quite recently administered by several others—notably by Karst—who do not speak in any glowing terms of its intestinal disinfecting powers. It has, however, been found to possess expectorant properties.

Dose for adults—2 to 8 grs. every 3 or 4 hours; for children —½ to 2 grs. in wafer paper.

Naphthol. $C_{10}H_7OH$. (Iso-naphthol).

This coal tar derivative resembles the preceding only in some points. It is in minute, shining, white crystals, with an agreeable balsamic odour. It is poisonous when given in large doses, though Shoemaker failed to poison rabbits with it. When absorbed, according to Brunton, it causes vomiting, loss of consciousness, and hæmaturia.

Its action upon the skin resembles that of tar, and it is for this that it has been introduced into medicine. Kaposi uses it with great benefit in *eczema*, *psoriasis*, *scabies*, *chronic ulcers*, &c. It has been likewise used as a gargle in *diphtheria*, an injection in *leucorrhœa*, *gonorrhœa*, &c., in the strength of 2 to 5 per cent. Ointments for scabies and psoriasis should contain 15 per cent. From a careful examination of the recent literature of the Therapeutics of Naphthalin and Naphthol, one is forced to conclude that the commercial samples used by some

observers were very impure, while the processes of purification to which the impure drugs have been submitted have altered their composition. In no other way can one explain the diverging reports of Rossbach, Schwartz of Zurich, Professor Eichhorst, Albertoni, and others.

Nickel Salts,

Especially the bromide, have been investigated by Da Costa, who has given it in *epilepsy* with advantage and in congestive headaches with decided benefit. He finds that much smaller doses are necessary than of other bromides; thus 5 grs. is a fair dose and 10 grs. a very full dose. It is a green soluble substance. The sulphate (3 to 5 grs. in solution) has been administered as a nervine tonic in *locomotor ataxia*.

Nitrogen.

The carefully-conducted experiments of Valenzuela with this gaseous element would lead one to hope that with care it may become a remedy of value in the treatment of disease. He found that inhalations of air, with the addition of half its volume of nitrogen, produced quickening of pulse and respiration and increase of body heat, soon, however (in 5 minutes), followed by slowing of the heart and breathing, and a marked fall in temperature, and elimination of urea, the effects being much the same as when rarified air is breathed, the combustion being checked by the absence of the usual amount of oxygen. He used the inhalations in cases of phthisis, and reports, "always with the suspension of the progress of the disease." Sweating, fever, cough, pain, expectoration, dyspnœa, and wasting become much less. The patient eats, sleeps, and digests better, and soon begins to gain in weight. Good results were also found in *asthma* and many other irritable conditions of the pulmonary apparatus. The usual rule was—two inhalations in the day for ½ to 1 hour each. It would appear that Nitrogen when thus used to dilute atmospheric air may, when judiciously administered, be a valuable antipyretic.

Nitrites of Potassium and Sodium.

Have been introduced by Reichert, having been found to possess similar properties to nitroglycerine and nitrite of amyl; thus, within 10 to 15 minutes after a dose of 5 grs. of either salt there follow flushing of the face, throbbing of the head, increased frequency of the pulse, lowering of the arterial pressure, &c. Dr. Hay has tried the nitrite of sodium in *angina* with the most satisfactory results. He has closely

studied its chemical action alongside nitrite of amyl and glonoine, and believes they all owe their activity to the nitrous acid contained in them. (See under Nitro-glycerine, page 425).

There appears to be a decided advantage in favour of nitrite of sodium over the amyl salt in the duration of its influence, but it has the corresponding disadvantage of being slower in giving relief unless taken *before* the attack, a disadvantage which caused the great discoverer of the virtues of these salts (Brunton) to discard it in favour of amyl.

R. M. Simon has used the nitrite of sodium with good results in the increased arterial tension of *granular kidney disease*, especially when associated with a weakened and dilated heart, also with marked effect in aortic disease.

It does not cause so much throbbing and headache as Murrell's remedy—nitroglycerine. Lublinski has employed it in *hemicrania* and in *asthmatic complaints* of purely bronchial and neurotic origin with marked success.

Dose—½ gr. will be found quite sufficient to begin with, and rarely will 3 grs. be required. It can be given in solution in water.

Oil of Cade. (Huile de Cade.)

The origin of this remedy, about which there has been always some mystery, has been cleared up by Dr. Amory. It is a product of the destructive distillation of the wood of Juniperus Oxycedrus, manufactured by the peasants in the Var district, in the South of France. For a long time it has been used now and then as a remedy in skin diseases, but its present popularity dates from its reintroduction by Hebra, who used it as a parasiticide and stimulant in obstinate *scaly eczema*, *psoriasis*, and affections in which tar has been employed. 2 drs. of the oil, mixed with 8 drs. of spermaceti ointment, or preferably an ointment prepared by heating equal weights of yellow wax and huile de cade, will form suitable methods of applying the drug.

Opium Smoking.

Thudichum has advocated this method of using opium as a remedy in various diseases, especially to calm *cough*, relieve *cephalalgia*, *migraine*, and *neuralgia*, in which latter affections it is claimed to be curative. The aqueous extract of opium is recommended in minute quantities (2-5 grs.), placed in the bowl of a diminutive pipe. It is claimed for the method that it produces no digestive troubles, and is not

likely to be followed by the establishment of the opium habit. With the prejudice in this country against the horrors of opium smoking, it is highly improbable that it will ever be even seriously tried.

Oxygen.

During the last few years this element has been tried in the treatment of diseases with very varying success. Recently, however, Lashkeviteh has satisfied himself that it had the power of markedly lowering exeited reflex aetion, and suggested that a trial of its use in *puerperal eclampsia* might lead to good results. Dr. Favr, aeting upon this foreeast, has tried inhalations in two eases of *eclampsia* with what must be pronounced to be a very deeided sueeess. and he is sanguine that its use in every lying-in hospital will be soon a matter of routine when symptoms of eonvulsions appear.

Kirnberger has been trying the value of Oxygen in *leukæmia* with the view of obviating the retarded tissue metamorphosis whieh is eharaeteristie of the disease. He details a ease where after the daily inhalation of 30 litres of the gas for 10 days the patient—a boy—showed marked signs of improvement, and at the end of 6 or 8 weeks appeared to be well. He was submitted to a renewal of the treatment a few times during the six months following, and finally was eompletely restored to health.

Dr. Galan has reeorded the sueeessful use of Oxygen inhalation in eases of severe and very extensive burns interfering with the eutaneous respiration; 70 litres per day were used, and good results have followed the use of oxygenated baths in similar eases.

Dujardin-Beaumetz has introdueed siphons of water and lemonade eharged with oxygen gas (instead of earbonie aeid), whieh he has found benefieial in *dyspepsia* and *polydipsia*. The writer in 1874 tried ozone for the relief of aeute suffoeative *bronehitis*, but found that the relief afforded by the first few moments of inhalation was more than eounterbalaneed by the inereased embarrassment of the breathing whieh supervened.

Ozoneine is the name of a new liquid prepared by Beek, and which has been tested quite reeently by Long and Brand, of Toulon, in *cholera* and *smallpox* with eneouraging results. Onimus, of Paris, has found it to be little inferior in its disinfeeting properties to pure gaseous ozone, to whieh it owes its valuable germ-destroying qualities. Further experienee will probably assign to it a plaee amongst antiseptie remedies. It may be praetically regarded as a saturated solution of ozone. (See also under Therpylene Hydras.)

Pancreatine.

Various attempts have been made from time to time to utilise the digestive ferments contained in the secretion of the pancreas, hitherto with only indifferent success, as the forms in which they have been presented generally were a barrier to their acceptance. Their proneness to change and their odour prevented them receiving that trial which their importance justified. There are at least four digestive ferments contained in the pancreas, the most important being Trypsin, which changes proteids into peptones. Of the other ferments one emulsifies fats, one changes starch into sugar, and one coagulates the casein of milk. Under the name of Pancreatine is prepared from the pancreas of the pig a dried powder, which is mixed with pulverised malt. It may be given in doses of 3 to 5 grs. in *dyspepsia*. Benger's Liquor Pancreaticus is a tincture of the pig's pancreas made with weak spirit, and contains at least 3 of the ferments. It may be mixed with food in teaspoonful doses or added to nutritious enemata. It requires an alkaline medium for the ferments, and soda may be added with advantage. Milk as warm as when coming from the cow may be readily peptonised in this way by a teaspoonful of the liquor added to each tumblerful.

The preparation sold under the name of Pancreatic Emulsion, and supposed to contain an emulsified and pancreatised animal fat, is often a compound which phthisical patients cannot tolerate.

Fairchild's Extractum Pancreatis, in the form of an unobjectionable dry powder, is by far the best preparation introduced. It can be added to the milk of the cow, which can be thus predigested, and is of enormous benefit in the feeding of feeble infants deprived of the natural nourishment.

Trypsin has been lately used with good results as a digestive application to the false membrane in *diphtheria*. A solution of Fairchild's extract, as made by Burroughs, Wellcome, & Co., can be utilised for this purpose.

Papain and Papayotin.

The first-named is the soluble ferment prepared from the juice of *Carica papaya* by precipitation with alcohol; it is in the form of a white powder. It possesses the remarkable power of digesting animal substances as pepsin does. Papayotin is, strictly speaking, the milky juice obtained by incisions made into the unripe fruit, collected and dried. The words papain and papayotin are, however, often used synonymously. In the West Indies the papaw juice is used to render the toughest

meat quite soft and digestible. Bouchut has experimented with the ferment and with the juice in *diphtheria*, and found that they possess the power of digesting, dissolving, or disintegrating the false membrane when applied locally. Schaeffer employed the ferment in nearly 50 cases of diphtheria with a mortality of 4 per cent., whilst Koths and Ash had a mortality of nearly 50 per cent., and Drier experienced a death percentage of 64.

Though the papain or papayotin has a decided action on the membrane in nearly every case, it is very doubtful if it is of any use in diminishing the fatality of the disease. The juice and ferment have been used internally with benefit in *dyspepsia* and gastritis, and have been used to destroy epithelial cancers.

Papaverine.

Is one of the colourless, crystalline alkaloids of opium. Owing to impurities and difficulties in isolating these alkaloids, the greatest diversity of opinion exists about their action. Thus the ordinary dose of this substance is given as ½ gr. Hoffmann affirmed he took 50 times this quantity without experiencing any effects whatever. Fronmuller states that it is narcotic, and that it dilates the pupil, and does not affect pulse, temperature, or respiration. Other observers find it markedly diminishes these. In our present state of knowledge its administration to man is not to be advocated.

Paraldehyde. ($C_6H_{12}O_3$.)

This fluid, which is a polymeric form of aldehyde, solidifying below 50° F., has been recently introduced as an hypnotic by Morselli. It resembles chloral in its action, only instead of weakening the heart it strengthens it and diminishes its frequency. It acts as a powerful diuretic, increasing notably the amount of urine, but has no diaphoretic action. It has been given in *mania*, *melancholia*, *sleeplessness* from various causes, always with success, and does not cause digestive or cerebral disturbances afterwards. Dose—30 to 60 minims in water. Its only drawback is its rather unpleasant, chloroform-like odour, which affects the breath for many hours, and its sharp, disagreeable taste. It should be given in peppermint water and syrup or in almond mixture. The sleep which it produces is calm and refreshing, like natural slumber. It produces no excitement, and is more speedy in its action than chloral, and is not followed by headache. It is especially valuable as a safe hypnotic in the *insomnia* of *cardiac diseases*. The experiences of the numerous observers who have been

using this remedy during the last 2 or 3 years are most gratifying.

Parrish's Syrup. (Syr. Ferri Phos. Co.)

This is one of the best known and most extensively employed of non-official remedies. It is known as "Chemical food," and is a valuable and agreeable method whereby the virtues of iron are combined with the restorative action of calcium and other salts. Each fluid dram contains—

Phosphate of Iron		1 gr.
,, Calcium		$2\frac{1}{2}$ grs.
,, Sodium		$\frac{1}{12}$ gr.
,, Potassium		$\frac{1}{5}$ gr.

Dose—1 to 2 drs., diluted.

Pelletierine.

An alkaloid, named after the great French chemist, is obtained from the bark of pomegranate root. The bark contains four alkaloids or pelletierines, only two of which are possessed of any anthelmintic action, and it is chiefly "Pelletierine," or its tannate, which is used in medicine. Brunton, in his new work on "Pharmacology," mentions the dose as $\frac{1}{2}$ to $\frac{2}{3}$ gr. (0·03—0·05 gramme); this is either a mistake or else he must refer to a very pure preparation, which is hitherto unknown commercially. Those who have used the drug have employed the ordinary pelletierine—or, as it is sometimes called, Punicine—in doses of 12 times this amount—the usual dose being about 5 to 7 grs. of the sulphate, given either along with or immediately after the administration of 8 to 10 grs. of tannic acid, fasting, and a purge in about one hour. This plan of treating tapeworm has given far better and more uniform results than any other. Von Schröder has demonstrated the action of this remedy outside the body upon living specimens of tænia serrata: he found the addition of $\frac{1}{10000}$ part of pelletierine to the fluid containing the parasites caused their death in a few minutes. Pelletierine causes an increase of blood pressure and disturbs co-ordination. It has been given hypodermically in some forms of *paralysis*, *tetanus* and *hydrophobia*, but with doubtful benefit.

Picrotoxin. (See page 517.)

Piperine. U.S.P.

The alkaloidal substance obtained from *Pip. longum* and *nigrum*, in colourless or pale yellow crystals, is included in the new U.S.P. It has been recommended as a substitute for

quinine in the treatment of *intermittent fevers*. It has, however, been supposed that its antiperiodic virtues depend upon impurities. It is, nevertheless, decidedly antipyretic. It possesses all the therapeutic virtues of pepper, and has been given in *gonorrhœa*, *dyspepsia*, &c.

Dose—5 to 15 grs.

Piscidia Erythrina. (Jamaica Dogwood)—Leguminosæ.

The bark of this tree has been used to catch fish, which are speedily intoxicated by it. Its physiological action has been studied by Ott, who finds that it increases arterial tension by stimulating the monarchial vaso-motor centre; that it soon, however, weakens the heart, so that tension falls, and that a tetanoid condition results from its stimulation of the cord, whilst reflex action is reduced. Its effects upon the brain are not unlike those of opium; it causes deep sleep in moderate doses, which is not followed by any of the after ill effects of opium or morphine. It relieves pain, as was pointed out by Dr. Hamilton, who introduced it. It appears sometimes to act as a specific in *neuralgia* of every variety, though it is generally experienced that its anodyne influence is less than that of opium, whilst its hypnotic power is decidedly greater. For *insomnia*, arising from whatever cause, dogwood appears to be a very acceptable drug, for there is reason to *hope* that it is not likely to enslave like opium. It relieves cough and spasm without affecting the centres like opium. In addition to its anodyne and hypnotic qualities, it causes salivation and diaphoresis and dilates the pupil. In medicine it is the bark of the root which should be employed, and of the fluid extract (1 oz. to 1 oz.) from 40 to 60 minim doses may be given. It should be commenced with caution, as untoward effects have already been noticed, and it appears to be uneven in its action on different people. There is a resinous granular body known as Piscidin, a dry alcoholic extract, which may be given in ½ gr. doses, and there is the ordinary extract. The liquid is the most reliable.

Plantago Lanceolata. (Plantain or Ribbed Grass.)

This common weed has been introduced by Quinlan, who has shown it to be a hæmostatic of some value. Applied in the form of a paste made with the pounded leaf and glycerine, or as a powder of the dry leaf, or as the juice or green extract, it has been found by him to stop *hæmorrhages* speedily. He believes its action is partly vital and partly mechanical, like matico.

Pongamia Glabra. (Leguminosæ.)

The deep yellow oil expressed from the seeds of this tree, and known as Pongamia or kurung oil, has been long used by the natives of India in *skin diseases*, and the careful experiments of Dymock prove the oil to be an excellent remedy in *pityriasis versicolor*, rubbed in twice a day. It has advantages in not irritating or discolouring the parts, and it may be used for parasitic skin diseases. The oil becomes solid at temperatures below 60° F.

Potassii Silicatis Liquor. (Soluble Glass Solution.)

This substance is a powerful antiseptic, and has been used (1 to 4) as an application to *erysipelas* with encouraging results. It has also been tried in *gonorrhœa*, *cystitis*, *vaginitis*, &c., but it is for its important use in making a strong, splintlike casing for broken limbs that it is used in surgical practice. Bandages soaked in this solution and applied to the limb, when dry give a support obtainable in no other way. Martindale recommends a mixture of 2 parts of this solution with 1 of the corresponding sodium salt solution as affording a liquid which sets quicker and more firmly than either solution separately.

Propylamine. (Trimethylamine or Secaline.)

A compound ammonia, obtained by distilling herring brine (or decomposing fish) with lime. It may be also obtained from various vegetable sources, as ergot, arnica, codeine, &c. It has been found successful in the hands of some in the treatment of *acute rheumatism*, in which disease it has been found to relieve pain, reduce temperature, and diminish the frequency of the pulse.

Its external use as a liniment (1 to 3 of glycerine), applied to the painful joints of *chronic rheumatism*, has given such relief as to warrant its introduction as an anodyne.

Large doses increase the frequency of the pulse, whilst small doses exert a sedative action upon the heart, and act as a stimulating expectorant.

Dose of the hydrochlorate, 2 grs. every 2 hours, or 20 minims of the distilled solution (20 per cent.) in peppermint water and sugar, which disguise its fishy taste and smell.

Prunus Virginiana. (Wild Cherry Bark.) U.S.P.

The bark of *Prunus Serotina* (not of Prunus Virginiana) is a bitter *tonic*, acting on the mucous membrane of the stomach as a slight irritant, increasing its vascularity and secretion,

like the older bitters, calumba, &c. This action is, however, somewhat antagonised by the tannin contained along with the bitter extractive, which at the same time confers *astringent* virtues upon the remedy. It contains also amygdalin and emulsin, which give a percentage of Prussic acid in the liquid preparations that confers *sedative* properties upon them.

The bark is much used in America, where the syrup (U.S.P.) is freely given in teaspoonful doses to allay the cough and sweating of *phthisis*. The infusion (U.S.P.) in wineglassful doses in *dyspepsia*, or the tincture in half dram doses as a tonic in convalescence from acute diseases.

Pulsatilla. (Meadow Anemone.) U.S.P.

Under this name are included *Anemone Pulsatilla*, *A. pratensis* and *A. patens*. It has been very extensively tried in America. Shapter, who has watched its effects, concludes that it acts by controlling irritability and over activity of the ganglionic nervous system, and has no claim, except indirectly, to be classed with hellebore and aconite as a vascular sedative. He has employed it in *eclampsia* from various causes, and found it beneficial. Clarus found that it was poisonous in large doses by causing vomiting and purging, with bloody urine, and that the respiration, cord, and medulla were paralysed.

It has, however, been given with success in spasmodic *catarrhal affections of the bronchi*, and in *spasmodic dysmenorrhœa*, *amenorrhœa*, *neuralgia*, and many other affections, where its mode of acting is somewhat mysterious. And recently it has been extolled as a never-failing remedy in *acute epididymitis*, in 2 minim doses of the tincture every 2 hours.

Anemonin, its active principle, may be given in doses of $\frac{1}{20}$ gr. in pill, or the tincture of pulsatilla (1 to 8) 2 to 5 minims in water.

Pyridine.

Is a powerfully smelling liquid product of the dry distillation of many organic substances, and is supposed by Dr. Keser to be the active principle of the various cigarettes and papers for *asthma*. It has lately been tried in *asthma* with most marked benefit by Sée and Bochefontaine. The vapour of about one teaspoonful is exposed in a small room in which the patient is placed for less than half an hour three times a day. The *dyspnœa* is soon relieved, and the distress of the attack passes off speedily. It is probably one of the products formed during the ignition of a powder—a new patent remedy for

asthma, known as Girdwood's asthmatic remedy, which the writer has seen produce marked relief during the painful paroxysms of this disease.

Quebracho.

Under the heading of Aspidospermine, page 507, the therapeutic properties of the bark of Aspidosperma quebracho are described. The bark has been used in the form of tincture (1 in 5) in doses of ½ to 2 drs.—to reduce the temperature in *fevers*, *inflammation of serous membranes*, and *rheumatism*, in which cases it possesses the power of reducing the frequency of the pulse to a marked degree, as many as 30 beats per minute, the temperature falling from ½° to 3°. It is, however, in *asthma* and *dyspnœa* that the drug will be found most valuable. (See page 507.)

Quinetum.

This is a cheap substitute for quinine (or quinia). It consists of a mixture of the alkaloids obtained from the red cinchona bark. It possesses all the properties of the bark; its astringency is, however, feeble; its use in *ague*, *fevers*, and all affections in which quinine has been valuable has been followed with satisfactory results. It is not so presentable as quinine, owing to its dirty white appearance. The sulphate of quinetum, however, is a more elegant preparation. As the substance known under the name of Quinetum consists chiefly of cinchonidine salts, which are now introduced into the new Pharmacopœia, it requires little mention, as these salts should alone be employed when a cheap cinchona alkaloid is required.

Dose—Same as of quinine, 1 to 20 grs.

Quinine Salts.

Quinidinæ Sulphas.—The neutral sulphate of an alkaloid, prepared chiefly from *C. Pitayensis* (U.S.P.), in white silky crystals, not so bitter as quinine, and less expensive. This salt is very suitable for administration to children, who do not object to its taste so much as to quinine.

It is a valuable antipyretic and antiperiodic.

Dose—Same as quinine, but it is chiefly used when large doses (20 grs.) are required to bring down fever heat in *rheumatism*, *typhus*, *typhoid*, and *pneumonia*.

Quininæ Hydrobromas (U.S.P.)—In yellowish lustrous needles. 4 grs. dissolve in 1 dr. of water for hypodermic injection, which may be repeated every 4 hours without causing

irritation. The acid hydrobromate of quinine is more soluble than the above, which is neutral. 1 dr. of water will dissolve 10 grs. of it. Where quinine cannot be given by the mouth this is the salt which should be employed. A very much smaller dose is necessary when injected into the subcutaneous tissue It produces, whether taken by the mouth or injected, less unpleasant symptoms than the other quinine salts.

Quininæ Lactas has recently been shown by Vigier to be a salt, very suitable for hypodermic administration in aqueous solution (1 to 4).

Quininæ Salicylas.—This salt meets a want which the physician frequently experiences when he wishes to combine quinine with salicylic acid or its salts in *chronic* or *sub-acute rheumatism*, or in *neuralgia* occurring in rheumatic patients. The method of prescribing salicylic acid in a mixture with quinine often leads to the formation of an incompatible mess, which accumulates in the mixture and adheres like wax to the sides of the phial. This salt, prescribed in the form of pills, 4 grs. each made up with Proctor's paste, will give satisfaction.

Quininæ Valerianas (U.S.P.)—In white lustrous crystals, smelling slightly of valerianic acid. In addition to the valuable properties of quinine, this salt possesses superior power over *neuralgia* in hysterical patients. The dose should not exceed 3 grs., and should be given in pill.

Resorcin.

A white crystalline product obtained from benzine. It is a powerful antiseptic, and chemically and physiologically it is closely allied to carbolic acid, over which, however, it possesses the very decided advantages of being *much more soluble, free from odour*, and *non-irritating*.

As the result of experiments on animals it was found that moderately large doses produce clonic convulsions, quickness of pulse and breathing; these disappeared in one hour: consciousness remained clear. When this dose was doubled the convulsions became very severe, the pupils dilated, and consciousness was lost, to return again inside two hours. When the dose was increased death occurred in 30 minutes.

It has antipyretic powers, and Brieger found that full doses, though they only slightly reduced the temperature, led to unpleasant results; and he found that most of the patients so treated fainted often, had singing in their ears, and became violently delirious, as in poisoning by carbolic acid. It causes profuse perspiration, and the duration of the fall of tempera-

ture is very short. Resorein is exereted by the kidneys, as ether and sulphurie aeid.

In the *diarrhœa of children* small does (1 gr.) have aehieved good results. It has been given in *ague*, and was supposed to resemble quinine in its action, but the large doses whieh are neeessary in this disease are dangerous.

As a loeal agent in *diphtheria* this remedy promises well, Andeer having sueeessfully treated 222 eases with it without a death. He applied it either as a eoneentrated vaseline ointment or brushed the erystals over the loeal seats of disease; this was frequently repeated in severe eases, and the agent was in such eases administered internally.

It is externally that resorein promises to be a remedy of greatest valuc, a 2 per eent. solution in water making a liquid of strong antiseptie powers, useful as a *dressing* lotion to *wounds* of all kinds and to *parasitic skin diseases*. A solution of 20 grs. to 1 oz. has been frequently used as an injection in *cystitis* and *gonorrhœa*, but it sometimes eauses violent irritation. A solution of the same strength has been used with benefit as a lotion to syphilitie sores and uleerations.

Andeer has found it of great use in laryngeal diseases. It acts as a local anæsthetie in these eases, and if applied in eoneentrated form it becomes a safe and painless eaustie very aeeeptable in tubereular laryngitis, where it subdues pain and eough. Mannino and Gatehkovsky have reported most satisfactory experienees of the use of resorcin as a powerful alterative to *cancerous growths*. The latter surgeon applied it either in substanee or in the form of an ointment (50 per eent.) to *epithelial cancers of the lip*, whieh rapidly eieatrised, and with benefit to eaneer of the *rectum* and *uterus* dusted twiee daily with the powdered drug.

15 grs. dissolved in 1 oz. of ehloroform water should be a maximum dose to begin with.

1 to 5 grs. may be given in the *diarrhœa* of childhood.

Rhigolene. (Amyl Hydride.)

Has been found by Riehardson to produee local anæsthesia by reducing the temperature through its rapid evaporation. He found that a mixture of 1 dram of eamphor and 1 of spermaeeti dissolved in 2 ozs. of rhigolene applied on eotton wool to burns produeed rapid relief from pain by its evaporation, and there was left a safe protective eoating upon the injured surfaee, whieh aeted the part of an impervious dressing. Iodine dissolved in rhigolene, making a 1 per eent. solution, affords an exeellent means of depositing this anti-

septic and alterative substance in a state of minute subdivision upon the face of a foul discharging or *syphilitic sore*.

Rhinacanthus Communis.

The leaves of this popular Chinese and Indian plant when bruised and mixed with lime juice are a prized remedy for *ring-worm* and *parasitic skin affections*. The tincture of the root is used as an application to chronic *eczema*, *tinea*, and *psoriasis*. It is known as *Hong-Pang-Chong*. Internally, it has feeble antiperiodic and tonic powers like quinine.

Rhus Aromatica. (Fragrant Sumach.)

This plant possesses astringent properties, which have given it a favourable place in the estimation of many in *cystitis*, *hæmorrhage*, *night-sweats*, *diarrhœa*, *hæmaturia*, *menorrhagia*, and *dysentery*. Its pharmacology is not clearly understood, but it appears to have some selective action upon the urinary tract, to which it is a tonic.

Excellent results have followed its administration for the *nocturnal incontinence of urine*.

Dose—Of the liquid extract—(1 to 1) 20 minims every two or three hours, or after each loose motion.

Rhus Toxicodendron. (Poison Ivy.) U.S.P.

The fresh leaves of this plant cause great cutaneous irritation and inflammation even upon slight contact in some people, often great œdema and pain supervening. Internally, in large doses similar action appears to be excited in the stomach and intestines, and even the emanations from the plant produce eczematous eruptions. It possesses properties when given in minute doses—2 minims of tincture (1 to 8) diluted—like the preceding remedy, and has been administered for *incontinence of urine* and *atony of the bladder*.

Rumicin. (Yellow Dock.)

The eclectic preparation obtained from *Rumex crispus*. It is vaunted as possessing astringent and aperient qualities like rhubarb, and alterative and tonic virtues in doses of 2 to 5 grs., in pill. It contains chrysophanic acid, and has been given internally in *psoriasis*.

Sanguinaria Canadensis. (Blood Root.) U.S.P.

The rhizome of this perennial plant has been found in full doses to cause vomiting, purging, salivation, dilatation of the pupils, collapse, and death, preceded occasionally by convul-

sions, and a marked rise, afterwards followed by a more marked fall in arterial tension and pulse. Reflex exeitability, respiration, and museular eontraetility are diminished.

Sanguinarin, the aetive prineiple, has been used with some sueeess in *bronchitis* and *pneumonia*. It aets as a valuable stimulating expeetorant in *chronic bronchitis*, and in small doses ($\frac{1}{10}$ to $\frac{1}{6}$ gr.) it does so without irritating the stomaeh. In still smaller doses ($\frac{1}{20}$ to $\frac{1}{10}$ gr.) it may be given for *atonic dyspepsia*, as it inereases the seeretion of the stomaeh and intestines. It has been tried in *febrile* eonditions for its sedative aetion upon the vaseular system, but, as it only aets in this way in full doses ($\frac{1}{2}$ to 1 gr. or more), whieh eause mueh irritation of the stomaeh, it is inferior to hellebore, aeonite, and other remedies.

It aets as an emmenagogue, and has been given in funetional uterine ailments. The dose of the U.S.P. tineture is 30 minims or of the fluid extraet 5 minims.

Scopolein

Is an alkaloid obtained from Seapolia japoniea, whieh has reeently been found by Pierd'houy to eause rapid, painless, and persistent dilatation of the pupil. Contrasted with atropine, he found the greatest degree of mydriasis and paralysis of aeeommodation produced in a little more than half the time required for the full aetion of atropine. It lasted mueh longer, and was not overeome by eserine. He believes that it will be employed in preferenee to atropine.

Sedum Acre. (Wall Pepper.)

The pungent juice of this erassulaeeous plant is being extolled as a never-failing remedy in *diphtheria* by Dr. Duval, of Madrid. He states he has employed it in 300 eases without a single death. He boils the juiee with beer, and gives it till eopious vomiting is induced. Probably any good effeets may be the result of the meehanical dislodgment of the false membrane, as Sedum Aere has been hitherto unknown to possess any properties unless those of an irritating emetie and mild eounter-irritant.

Sodii Benzoas.

Has been highly reeommended by Klebs in all *zymotic* affections. It is a deeided antiseptie, and has been of use in *diphtheria*, either applied in the form of powder through an insufflator to the affected parts, or as a gargle (1 to 20), or as a spray for inhalation (about 2 to 20). It has been used in-

ternally at the same time in doses varying from 10 to 30 grs. in water every three or four hours. In acute *rheumatism* (in which it acts like salicylate of sodium), *diarrhœa* of children, and in all diseases caused by infection, this salt will be found useful. Its action is readily understood by its antiseptic properties. In the hands of some observers rather surprising results have been obtained in the treatment of *phthisis* by this remedy. It has been given in *gout* to help elimination of uric acid with some advantage.

Sodii Nitris.

This salt, which has recently been used as a substitute for nitrite of amyl, will be found noticed upon page 548.

Sodii Tannas.

Lewin recommends strongly the administration of this salt instead of tannin in *chronic albuminuria*, to lessen the amount of albumen. The experiments of Ribbert, who produced artificial albuminuria in rabbits, by ligature of the renal artery, show that scarcely any albumen was found in the glomeruli when tannate of sodium was injected into the veins.

Administered in doses about the same as of tannin, it has been found to sometimes produce great gastric disturbance, and sometimes diarrhœa. It is advisable not to administer at first more than 5 grs.

Spigelia. (Carolina Pink.) U.S.P.

The rhizome and rootlets of Spigelia Marylandica (Maryland Pink) in the form of a fluid extract (1 in 1) is used in America as a remedy for the round worm. It appears to be almost as satisfactory as santonin. It is mildly purgative, and, like santonin, its effects are increased if coupled with or followed by a purgative; 1 teaspoonful of the fluid extract may be given with a tablespoonful of syrup of senna.

Stigmata Maidis. (Stigmata of Maize, Corn Silk.)

The stigmata of *Zea mays*—Indian corn—has recently been much praised in America as possessing specific or alterative action upon the bladder and genito urinary tract. It appears to be most active when prepared *fresh*, and good results have followed its use in *cystitis*. It is a diuretic of the mildest and least irritating type. In the *nocturnal incontinence* of urine it has been tried with benefit.

Dr. George St. George has obtained excellent results with the liquid extract of maize stigmata in cases of *catarrh of the*

bladder, and in one case where the ureter was inflamed, this remedy "relieved pain and suppressed discharge as if by magic." He has also found it to diminish the anasarca and increase the urine in *cardiac* dropsy.

Professor Korczynski has found this remedy very useful in cases of *renal calculi*, and *catarrh of the bladder*, and *pelvis of the kidney*. He uses the extract in 4 gr. doses in pill.

Dupont has examined the pharmacology of this drug, and found that it possesses properties which place it amongst the first of remedies as a diuretic and cardiac tonic, like digitalis. He found that the extract was well tolerated, that it increased the urine from 20 to 80 ozs. sometimes. He believes it to be specially indicated in *heart diseases with much dropsy*. It acted more speedily than digitalis; it reduced the pulse rate and increased the heart's strength. 20 grs. of the extract was given 3 or 4 times daily.

Dose—1 dr. of the liquid extract (1 to 1).

Stillingia Sylvatica. (Yaw Root or Queen's Root.) U.S.P.

This remedy has been long used in America as an alterative, and Bartholow speaks highly of it as having given good results in *syphilis* and *struma*.

It is a sialagogue, and when swallowed appears to increase the secretions of the gastric and intestinal glands by a mild irritant action; the liver is stimulated to secrete more bile, and if the dose be large, vomiting and purging supervene. The urine is markedly increased, and the bronchial secretion is augmented.

It has been given in *ascites*, caused by *cirrhosis*, in chronic *constipation* and *jaundice*, and in various *strumous* ailments.

Dose—Of the fluid extract (1 to 1), 20 minims to 1 dr. or of **Stillingin** (its eclectic extract) 2 to 4 grs.

Strophanthus Hispidus.

Prof. Fraser has found this plant to possess cardiac tonic and diuretic properties, and he has used it with benefit in *heart disease*. There is every reason to hope that his further investigations will prove it to be a remedy of great power.

Dose—of Strophanthin—$\frac{1}{80}$ gr. hypodermically.

Sulpho-Carbol.

Under its synonym of Aseptol upon page 506, the results of Annessens' experience of this new and remarkable antiseptic are briefly narrated. It may be mentioned that it is a syrupy rose-coloured volatile liquid, with a strong odour, possessing no corrosive or irritant action, and has been given internally in dram doses, freely diluted in sweetened water.

Terebene.

A powerful antiseptic, disinfecting, and deodorising liquid, with an agreeable balsamic odour, prepared by the action of sulphuric acid on turpentine and subsequent distillation. It is used when mixed with thymol and carbolic acid in equal proportions as an inhalation (½ dram to 1 pint of hot water) in *phthisis* or sprinkled over the wool in an antiseptic respirator.

Internally it may be given with advantage in 5 minim doses as an intestinal disinfectant, and as an astringent in the hæmorrhage of *phthisis*, and in *dysentery*. The cheap disinfectant liquor sold under this name is a valuable deodoriser for the sick room.

Thallin.

Is a synthetically prepared basic substance found by Skraup to form soluble tartrates and sulphates which strike a deep emerald-green colour with perchloride of iron, and hence its name. It has been proved by Jaksch, Alexander, Ewald, and others to possess marked antipyretic properties resembling in some respects quinine, antipyrin, and kairin, when given in doses of 2 to 5 grs. It produces no unpleasant after-effects, and causes a fall of temperature nearly as rapid as antipyrin—*i.e.*, in about 3 hours; but the fall lasts a much shorter time—generally about 5 hours, while the effects of antipyrin may last twice this period. The sharpness of the fall and the early ascent ushered in, often by rigors, are somewhat characteristic of thallin. It appears to possess only slight depressing effect upon the heart, and often copious sweating follows its use, though this cannot be regarded as an explanation of its temperature reducing properties, since sometimes it produces a marked fall without any action of the skin. In *typhoid fever*, in *phthisis*, and in *tuberculosis*, as is the case with antipyrin, the best results have been obtained. Dujardin-Beaumetz found that thallin causes a destruction of the red blood corpuscles, and he has been corroborated in this by other observers, who believe that antipyrin solely acts like resorcin upon the heat centres, not interfering with the composition of the blood in any way. Thallin may be found by further observations to possess superior powers as an antipyretic, but at present it offers no advantages over antipyrin. It may be given in doses of 5 grains every 5 hours.

Theine.

The alkaloid of tea (*Thea sinensis*) is identical with Caffeine (which see page 343).

Dose—2 to 6 grs., in a mixture or pill.

Mate, or Paraguay Tea. *Ilex mate or ilex paraguariensis* and other species of ilex yield about ½ per cent. of caffeine.

Khat, Cafta, or Arabian Tea. *Catha edulis* is used by the Arabs, who generally chew it to produce a form of very mild intoxication or sensation of cheerfulness and hilarity, accompanied with great watchfulness and wakefulness. Its active principle is identical with theine or caffeine.

Therpylene Hydras.

M. Boursier has discovered a substance by distilling the young buds of various species of pine, which he designates as Hydrate of Therpylene. It resembles turpentine, and is saturated with oxygen, and is rich in ozone. Labbé has tried it therapeutically, and finds it to be a powerful antiseptic, disinfectant, and deodoriser, which can be used with advantage as a surgical dressing to *fresh wounds* and *ulcers*, or as an application to destroy the fetor caused by the decomposition of the false membrane in *diphtheria* or as a disinfecting spray in the sick room. (See page 550.)

Tonga.

A preparation consisting of chopped stalks and small quantities of the leaves and inner bark of some plants imported from Fiji; believed to be derived from *Rhaphidophora vitiensis* or *Epipremnum mirabile*, and *Premna taitensis*. From these a liquid is prepared, whose properties have been found to be decidedly antineuralgic. Ringer and Murrell investigated the drug, and found it to speedily cure 6 out of 8 cases of *neuralgia* in which they tried it.

Dose—Of the liquid tonga, 1 dr. 3 times a day.

Trandescantia.

Trandescantia erecta is a Mexican plant used by the natives to stop bleedings from wounds. It is now cultivated at Versailles, and, according to the "Year-Book of Pharmacy," it is stated to possess very valuable styptic properties, and to be even superior in this respect to ferric chloride. If so, we shall soon hear more about it.

Traumaticine.

This is the name given to a solution of 1 part of gutta-percha tissue in 10 of chloroform, re-introduced by Auspitz for the treatment of skin affections. It was used by Graves, of Dublin, 30 years ago in *psoriasis* and *impetigo*. It forms on drying an unirritating, adhesive, permanent, non-contractile, flexible film, superior to gelatine and collodion (because it does not pucker up the skin).

It affords an excellent basis for the application of chrysophanic acid to *psoriasis*, the acid being first dissolved by the chloroform, the tissue added, and the resulting liquid applied with a brush. (See pages 396 and under Gelatine, page 529).

Trimethylamine. (See Propylamine, page 555.)

Triticum Repens. (Couch Grass.)

This common grass has been in the hands of some most successfully used in *chronic bladder* ailments. It is a feeble diuretic, and appears (after being tried by some surgeons for a considerable number of years) to possess the virtues claimed for the stigmata of maize. It has fallen into disuse, because the dried grass appears to be almost inert. It is the *fresh rhizome* which should be always used, 2 ozs. boiled in 1 pint water for half an hour, of which a wine-glassful should be taken every 4 or 6 hours.

Turpentine—Chian. (See page 515.)

Ustilago Maydis. (Corn Smut or Corn Ergot.) U.S.P.

The fungus which attacks maize, causing irregular swellings on the young ears, from the size of a pea to that of a fœtal head. The blackish dusty powder in the interior is the part employed. It appears to act like ergot, and it keeps better, and is less expensive, and is coming into favour in America and Canada. Brunton thinks it contains probably the same alkaloid as ergot. It appears, however, to differ from ergot in not producing prolonged contraction of the uterus, but in increasing markedly the rhythmic contractions and relaxations, hence it is more valuable during labour than after (Hubbard).

Dose—1 dr. of the liquid extract (1 to 1).

Urethan (Carbaminic Ether),

Or more correctly the ethyl ether of carbaminic acid, is a substance in soluble white inodorous crystals. It is prepared synthetically, and Jaksch has found it to be a prompt hypnotic not followed by any objectionable after consequences. Refreshing sleep was generally induced by about 8 grs. given at bed-time, and repeated in two hours, and sometimes again in two hours more if the effect was not produced.

Verbascum Thapsus. (The Mullein Plant.)

Attention has been drawn to the great usefulness of this plant as a potent remedy for increasing the weight in pul-

monary and other wasting diseases by Quinlan, who has carefully watched its weight-increasing properties in *phthisis*. In Ireland its virtues have been long appreciated by the poorer classes in pulmonary complaints, and the original method of administration, which is that recommended by Quinlan, is to boil 4 ozs. of the fresh leaves, or a corresponding quantity of the dry, for 10 minutes in a pint of fresh milk from the cow, to be drunk whilst still warm. This dose should be taken when possible 3 times a day.

It appears to act like Cod Liver Oil, and it also possesses expectorant properties. The virtue of three pints daily of good milk must very substantially augment the therapeutic action of the mullein plant.

The same authority has, however, experimented with this remedy, with and without milk, and is satisfied of its power over the nutrition of the body when given alone, as in the form of succus.

The taste of the plant is objectionable, and milk considerably masks it. The succus can be taken in porter. The young plants resemble those of digitalis in appearance.

Relief to *bronchial asthma* and to the hacking *cough* of phthisis has been obtained by smoking the leaves.

Viburnum Opulus. (The Snow Ball Tree.)

The dried leaves of this tree were found by Jacubovsky to relieve *angina pectoris*. Recently from Odessa comes the report of Dr. Manguby, who has tried the dried berries with very decided success in a case which resisted a catalogue of remedies, but which does not appear to have been treated with amyl or the nitrites. He prepares an infusion of two tablespoonfuls of the berries in water, which he causes to be administered in divided doses during the 24 hours. A fluid extract has been used in America with considerable benefit in *dysmenorrhœa*, and as a uterine sedative in *menorrhagia* and threatened *abortion*.

Viburnum Prunifolium. (Black Haw.) U.S.P.

The bark of this tree is in great repute in America; it possesses properties closely allied to the previous remedy, though there is no published account of its being used in *angina pectoris*. The liquid extract in one dram doses is given in *dysmenorrhœa*, and as a uterine sedative to prevent contraction of the uterus in the early months of pregnancy.

Viscum Album. (The Mistletoe—See page 546.)

Warburg's Tincture. (Tinctura Pyrexialis.)

A preparation which has gained for itself a very high reputation in the treatment of pyrexia; it is prepared from a formula published in the "Lancet" of Nov. 13th, 1875. It is undoubtedly of greatest value in *malaria* and other fevers, and in *malarial neuralgia*. It is administered in a tablespoonful dose, after the bowels have been thoroughly emptied; no drink being permitted; it is repeated again in 3 hours, after which profuse aromatic perspiration and a marked fall of temperature set in, with rapid convalescence. It is very useful in several forms of *collapse*.

Its power does not appear to lie in its quinine, camphor, aloes, rhubarb, or opium, but in some of the *aromatic* plants contained in it.

Wintergreen. (Gaultheria procumbens or Tea Berry—See page 529.)

PART VI.

CHEMICAL REACTIONS

OF THE

OFFICIAL REMEDIES.

Acetum ($HC_2H_3O_2$).

$$\underset{\text{Alcohol.}}{C_2H_5HO} + \underset{\text{Oxygen.}}{O_2} = \underset{\text{Vinegar.}}{HC_2H_3O_2} + \underset{\text{Water.}}{H_2O}$$

Acid. Aceticum and Acid. Acet. Glac. ($HC_2H_3O_2$).

$$\underset{\text{Sodium Acetate.}}{NaC_2H_3O_2} + \underset{\substack{\text{Sulphuric}\\\text{Acid.}}}{H_2SO_4} = \underset{\substack{\text{Acid Sodium}\\\text{Sulphate.}}}{NaHSO_4} + \underset{\text{Acetic Acid.}}{HC_2H_3O_2}$$

Acid. Boricum (H_3BO_3).

$$\underset{\text{Borax.}}{Na_2B_4O_7,10H_2O} + \underset{\text{Sulphuric Acid.}}{2H_2SO_4} = \underset{\text{Boric Acid.}}{4H_3BO_3} + \underset{\text{Acid Sodium Suphate.}}{2NaHSO_4} + \underset{\text{Water.}}{5H_2O}$$

Acid. Carbolicum (HC_6H_5O).

$$\underset{\substack{\text{Carbolic Acid.}\\\text{(Coal Tar Oil.)}}}{HC_6H_5O} + \underset{\text{Caustic Potash.}}{KHO} = \underset{\text{Pot. Carbolate.}}{KC_6H_5O} + \underset{\text{Water.}}{H_2O}$$

$$\underset{\text{Pot. Carbolate.}}{KC_6H_5O} + \underset{\text{Acid Hydroch.}}{HCl} = \underset{\text{Acid. Carbolic.}}{HC_6H_5O} + \underset{\text{Pot. Chloride.}}{KCl}$$

Acid. Chromicum (CrO_3).

$$\underset{\text{Bichromate of Potassium.}}{K_2Cr_2O_7} + \underset{\text{Sulphuric Acid.}}{2H_2SO_4} = \underset{\text{Chromic Acid.}}{2CrO_3} + \underset{\text{Acid Sulphate of Potassium.}}{2KHSO_4} + \underset{\text{Water.}}{H_2O}$$

Acid. Citricum ($H_3C_6H_5O_7,H_2O$).

$$\underset{\text{Citric Acid. (Lemon Juice.)}}{2H_3C_6H_5O_7} + \underset{\text{Calcium Carb.}}{3CaCO_3} = \underset{\text{Calcium Citrate.}}{Ca_3 2C_6H_5O_7} + \underset{\text{Water.}}{3H_2O} + \underset{\text{Carbonic Acid Gas.}}{3CO_2}$$

$$\underset{\text{Calcium Citrate.}}{Ca_3 2C_6H_5O_7} + \underset{\text{Sulphuric Acid.}}{3H_2SO_4} = \underset{\text{Citric Acid.}}{2H_3C_6H_5O_7} + \underset{\text{Calcium Sulphate.}}{3CaSO_4}$$

Acid. Gallicum ($H_3C_7H_3O_5.H_2O$).

$$\underset{\text{Tannic Acid. (Galls.)}}{C_{27}H_{22}O_{17}} + \underset{\text{Water.}}{4H_2O} = \underset{\text{Gallic Acid.}}{3H_3C_7H_3O_5} + \underset{\text{Glucose.}}{C_6H_{12}O_6}$$

Acid. Hydrobromicum Dilutum (HBr).

$$\underset{\text{Sulphuretted Hydrogen.}}{2H_2S} + \underset{\text{Bromine.}}{2Br_2} = \underset{\text{Hydrobromic Acid.}}{4HBr} + \underset{\text{Sulphur.}}{S_2}$$

Acid. Hydrochloricum (HCl).

$$\underset{\text{Sodium Chloride.}}{NaCl} + \underset{\text{Sulphuric Acid.}}{H_2SO_4} = \underset{\text{Hydrochloric Acid.}}{HCl} + \underset{\text{Acid Sulphate of Sodium.}}{NaHSO_4}$$

Acid. Hydrocyanicum Dilutum (HCN).

$$\underset{\text{Pot. Ferrocyanide.}}{2K_4FeC_6N_6} + \underset{\text{Acid Sulph.}}{6H_2SO_4} = \underset{\text{Hydrocyanic.}}{6HCN} + \underset{\text{Acid Sulph. of Potassium.}}{6KHSO_4} + \underset{\text{Everett's Salt.}}{FeK_2FeC_6N_6}$$

Acid. Lacticum ($HC_3H_5O_3$).

$$\underset{\text{Grape Sugar.}}{C_6H_{12}O_6} = 2(\underset{\text{Lactic Acid.}}{HC_3H_5O_3})$$

Acid. Meconicum ($H_3C_7HO_7$)

$$\underset{\text{Impure Meconic Acid.}}{2H_3C_7HO_7} + \underset{\text{Calcium Chloride.}}{3CaCl_2} = \underset{\text{Meconate of Lime.}}{Ca_3 2C_7HO_7} + \underset{\text{Hydrochloric Acid.}}{6HCl}$$

$$\underset{\text{Meconate of Lime.}}{Ca_3 2C_7HO_7} + \underset{\text{Hydrochloric Acid.}}{6HCl} = \underset{\text{Meconic Acid.}}{2H_3C_7HO_7} + \underset{\text{Calcium Chloride.}}{3CaCl_2}$$

Acid. Nitricum (HNO_3).

$$\underset{\text{Potassium Nitrate.}}{KNO_3} + \underset{\text{Sulphuric Acid.}}{H_2SO_4} = \underset{\text{Nitric Acid.}}{HNO_3} + \underset{\text{Acid Sulphate of Potassium.}}{KHSO_4}$$

Acid. Nitro-Hydrochloricum Dilutum ($N_2O_2Cl_4$).

$$\underset{\text{Nitric Acid.}}{2HNO_3} + \underset{\text{Hydrochloric Acid.}}{6HCl} = \underset{\text{Chloronitric Gas.}}{N_2O_2Cl_4} + \underset{\text{Water.}}{4H_2O} + \underset{\text{Chlorine.}}{Cl_2}$$

$$\underset{\text{Nitric Acid.}}{HNO_3} + \underset{\text{Hydrochloric Acid.}}{3HCl} = \underset{\text{Chloronitrous Gas.}}{NOCl} + \underset{\text{Water.}}{2H_2O} + \underset{\text{Chlorine.}}{Cl_2}$$

Acid. Oleicum ($HC_{18}H_{33}O_2$).

$$\underset{\text{Olive Oil.}}{C_3H_53C_{18}H_{33}O_2} + \underset{\text{Potassium Hydrate.}}{3KHO} = \underset{\text{Potassium Oleate.}}{3KC_{18}H_{33}O_2} + \underset{\text{Glycerine.}}{C_3H_53HO}$$

$$\underset{\text{Potassium Oleate.}}{2KC_{18}H_{33}O_2} + \underset{\text{Tartaric Acid.}}{H_2C_4H_4O_6} = \underset{\text{Oleic Acid.}}{2HC_{18}H_{33}O_2} + \underset{\text{Potassium Tartrate.}}{K_2C_4H_4O_6}$$

Acid. Phosphoricum Concentratum (H_3PO_4).

$$\underset{\text{Phosphorus.}}{3P_2} + \underset{\text{Nitric Acid.}}{10HNO_3} + \underset{\text{Water.}}{4H_2O} = \underset{\text{Phosphoric Acid.}}{6H_3PO_4} + \underset{\text{Nitric Oxide.}}{10NO}$$

Acid. Salicylicum ($HC_7H_5O_3$).

$$\underset{\text{Carbolic Acid.}}{HC_6H_5O} + \underset{\text{Carbonic Acid Gas.}}{CO_2} = \underset{\text{Salicylic Acid.}}{HC_7H_5O_3}$$

Acid. Sulphuricum (H_2SO_4).

$$\underset{\text{Sulphur.}}{S_2} + \underset{\text{Oxygen.}}{2O_2} = \underset{\text{Sulphurous Acid Gas.}}{2SO_2}$$

$$\underset{\text{Sulphurous Acid Gas.}}{SO_2} + \underset{\text{Water.}}{H_2O} = \underset{\text{Sulphurous Acid.}}{H_2SO_3}$$

$$\underset{\text{Sulphurous Acid.}}{H_2SO_3} + \underset{\text{Nitric Peroxide}}{NO_2} = \underset{\text{Sulphuric Acid.}}{H_2SO_4} + \underset{\text{Nitric Oxide.}}{NO}$$

$$\underset{\text{Nitric Oxide.}}{(2NO} + \underset{\text{Oxygen.}}{O_2} = \underset{\text{Nitric Peroxide.}}{2NO_2)}$$

Acid. Sulphurosum (H_2SO_3).

$4H_2SO_4$ + C_2 = $4H_2SO_3$ + $2CO_2$
Sulphuric Acid. Carbon. Sulphurous Acid. Carbonic Acid Gas.

Acid. Tartaricum ($H_2C_4H_4O_6$).

$2KHC_4H_4O_6$ + $CaCO_3$ = $CaC_4H_4O_6$ + $K_2C_4H_4O_6$
Acid Tartrate of Potassium. Calcium Carbonate. Tartrate of Calcium. Tartrate of Potassium.

+ H_2O + CO_2
Water. Carbonic Acid Gas.

$K_2C_4H_4O_6$ + $CaCl_2$ = $CaC_4H_4O_6$ + $3KCl$
Tartrate of Potassium. Chloride of Calcium. Tartrate of Calcium. Chloride of Potassium.

$2CaC_4H_4O_6$ + $2H_2SO_4$ = $2H_2C_4H_4O_6$ + $2CaSO_4$
Tartrate of Calcium. Sulphuric Acid. Tartaric Acid. Calcium Sulphate.

Æther ($C_4H_{10}O$).

C_2H_5HO + H_2SO_4 = $C_2H_5HSO_4$ + H_2O
Alcohol. Sulphuric Acid. Sulphovinic Acid. Water.

$C_2H_5HSO_4$ + C_2H_5HO = $C_4H_{10}O$ + H_2SO_4
Sulphovinic Acid. Alcohol. Ether. Sulphuric Acid.

Æther Aceticus ($C_2H_5C_2H_3O_2$).

C_2H_5HO + $NaC_2H_3O_2$ + H_2SO_4 = $C_2H_5C_2H_3O_2$
Alcohol. Sodium Acetate. Sulphuric Acid. Acetic Ether.

+ $NaHSO_4$ + H_2O
Acid Sulphate of Sodium. Water.

Æther Nitrosi Spiritus ($C_2H_5NO_2$).

$2C_2H_5HO$ + $2HNO_3$ + $2H_2SO_4$ + Cu_2 = $2C_2H_5NO_2$
Alcohol. Nitric Acid. Sulphuric Acid. Copper. Nitrous Ether.

$4H_2O$ + $2CuSO_4$
Water. Sulphate of Copper.

Alcohol (C_2H_5HO).

$C_6H_{12}O_6$ + Fermentation = $2C_2H_5HO$ + $2CO_2$
Grape Sugar. Alcohol. Carbonic Acid Gas.

Alumen—(Potassium)—($Al_2 3SO_4 K_2SO_4, 24H_2O$).

Al_2O_3 + $3H_2SO_4$ + K_2SO_4 + $21H_2O$ =
Oxide of Aluminium. Sulphuric Acid. Sulphate of Potassium. Water.

$Al_2 3SO_4, K_2SO_4, 24H_2O$
Potassium Alum.

Alumen—(Ammonium)—($Al_2 3SO_4, (NH_4)_2SO_4, 24H_2O$).

As above, substituting $(NH_4)_2SO_4$ for K_2SO_4

Ammoniæ Fortior Liquor (NH_4HO).

$2NH_4Cl$ + $Ca2HO$ = $2NH_4HO$ + $CaCl_2$
Ammonium Chloride. Calcium Hydrate. Ammonium Hydrate. (Ammonia.) Calcium Chloride.

Ammonii Acetatis Fortior Liquor ($NH_4C_2H_3O_2$).

$(NH_4HCO_3)_2, NH_4NH_2CO_2$ + $4HC_2H_3O_2$ = $4NH_4C_2H_3O_2$
Acid Carbonate and Carbamate of Ammonium. Acetic Acid. Acetate of Ammonium.

+ $2H_2O$ + $3CO_2$
Water. Carbonic Acid Gas.

Ammonii Benzoas ($NH_4C_7H_5O_2$).

$HC_7H_5O_2$ + NH_4HO = $NH_4C_7H_5O_2$ + H_2O
Benzoic Acid. Ammonia. Ammonium Benzoate. Water.

Ammonii Bromidum (NH_4Br).

HBr + NH_4HO = NH_4Br + H_2O
Hydrobromic Acid. Ammonia. Ammonium Bromide. Water.

Ammonii Carbonas ($N_3H_{11}C_2O_5$).

$2CaCO_3$ + $4NH_4Cl$ = $N_3H_{11}C_2O_5$ + $2CaCl_2$ +
Calcium Carbonate. Ammonium Chloride. Ammonium Carbonate. Calcium Chloride.

H_2O + NH_3
Water. Ammonia Gas.

Ammonii Citratis Fortior Liquor ($(NH_4)_3C_6H_5O_7$).

$$\underset{\text{Citric Acid.}}{H_3C_6H_5O_7} + \underset{\text{Ammonia.}}{3NH_4HO} = \underset{\text{Ammonium Citrate.}}{(NH_4)_3C_6H_5O_7} + \underset{\text{Water.}}{3H_2O}$$

Ammonii Chloridum (NH_4Cl).

$$\underset{\text{Ammonia.}}{NH_4HO} + \underset{\text{Hydrochloric Acid.}}{HCl} = \underset{\text{Ammonium Chloride.}}{NH_4Cl} + \underset{\text{Water.}}{H_2O}$$

Ammonii Nitras (NH_4NO_3).

$$\underset{\text{Ammonia.}}{NH_4HO} + \underset{\text{Nitric Acid.}}{HNO_3} = \underset{\text{Ammonium Nitrate.}}{NH_4NO_3} + \underset{\text{Water.}}{H_2O}$$

Ammonii Phosphas ($(NH_4)_2HPO_4$).

$$\underset{\text{Phosphoric Acid.}}{H_3PO_4} + \underset{\text{Ammonia.}}{2NH_4HO} = \underset{\text{Ammonium Phosphate.}}{(NH_4)_2HPO_4} + \underset{\text{Water.}}{2H_2O}$$

Amyl Nitris ($C_5H_{11}NO_2$).

$$\underset{\text{Amylic Alcohol.}}{2C_5H_{12}O} + \underset{\text{Copper.}}{Cu_2} + \underset{\text{Acid. Sulphuric.}}{2H_2SO_4} + \underset{\text{Acid. Nitric.}}{2HNO_3} = \underset{\text{Amyl Nitrite.}}{2C_5H_{11}NO_2} + \underset{\text{Copper Sulphate.}}{2CuSO_4} + \underset{\text{Water.}}{4H_2O}$$

Antimonii Chloridi Liquor ($SbCl_3$).

$$\underset{\text{Antimonium. Sulphide.}}{Sb_2S_3} + \underset{\text{Hydrochloric Acid.}}{6HCl} = \underset{\text{Antimonium Chloride.}}{2SbCl_3} + \underset{\text{Sulphuretted Hydrogen.}}{3H_2S}$$

Antimonii Oxidum (Sb_2O_3).

$$\underset{\text{Antimonium Chloride.}}{12SbCl_3} + \underset{\text{Water.}}{15H_2O} = \underset{\text{Antimonium Oxychloride.}}{2SbCl_3,5Sb_2O_3} + \underset{\text{Hydrochloric Acid.}}{30HCl.}$$

$$\underset{\text{Antimonium Oxychloride.}}{2SbCl_3.5Sb_2O_3} + \underset{\text{Sodium Carbonate.}}{3Na_2CO_3} = \underset{\text{Antimonium Oxide.}}{6Sb_2O_3} + \underset{\text{Sodium Chloride.}}{6NaCl} + \underset{\text{Carbonic Acid Gas.}}{3CO_2}$$

Antimonium Sulphuratum.

I.

$$\underset{\text{Sulphide of Antimony.}}{4Sb_2S_3} + \underset{\text{Sodium Hydrate.}}{12NaHO} + \underset{\text{Sulphur.}}{S_2} = \underset{\text{Sulph. Antimoniate of Sodium.}}{4Na_3SbS_4} + \underset{\text{Oxide of Antimony.}}{2Sb_2O_3} + \underset{\text{Water.}}{6H_2O}$$

$$\underset{\text{Oxide of Antimony.}}{Sb_2O_3} + \underset{\text{Sodium Hydrate.}}{6NaHO} = \underset{\text{Sodium Antimonite.}}{2Na_3SbO_3} + \underset{\text{Water.}}{3H_2O}$$

II.

$$\underset{\text{Sulph. Antimoniate of Sodium.}}{2Na_3SbS_4} + \underset{\text{Sulphuric Acid.}}{6H_2SO_4} + \underset{\text{Sodium Antimonite.}}{2Na_3SbO_3} = \underset{\text{Sulphate of Sodium.}}{6Na_2SO_4} + \underset{\text{Sulphide of Antimony.}}{Sb_2S_3} + \underset{\text{Oxide of Antimony.}}{Sb_2O_3} + \underset{\text{Sulphuretted Hydrogen.}}{3H_2S} + \underset{\text{Water.}}{H_2O}$$

Antimonium Tartaratum ($KSbOC_4H_4O_6,H_2O$).

$$\underset{\text{Acid Tartrate of Potassium.}}{2KHC_4H_4O_6} + \underset{\text{Oxide of Antimony.}}{Sb_2O_3} = \underset{\text{Tartar Emetic.}}{2KSbOC_4H_4O_6,H_2O}$$

Apomorphinæ Hydrochloras ($C_{17}H_{17}NO_2,HCl$).

$$\underset{\text{Morphine}}{C_{17}H_{19}NO_3} - \underset{(\textit{minus})\ \text{Water.}}{H_2O} = \underset{\text{Apomorphine.}}{C_{17}H_{17}NO_2}$$

$$\underset{\text{Apomorphine.}}{C_{17}H_{17}NO_2} + \underset{\text{Hydrochloric Acid.}}{HCl} = \underset{\text{Hydrochlorate of Apomorphine.}}{C_{17}H_{17}NO_2,HCl}$$

Argenti Nitras ($AgNO_3$).

$$\underset{\text{Silver.}}{3Ag_2} + \underset{\text{Nitric Acid.}}{8HNO_3} = \underset{\text{Nitric Oxide.}}{2NO} + \underset{\text{Nitrate of Silver.}}{6AgNO_3} + \underset{\text{Water.}}{4H_2O}$$

Argenti Oxidum (Ag_2O).

$$\underset{\text{Nitrate of Silver.}}{2AgNO_3} + \underset{\text{Hydrate of Calcium.}}{Ca2HO} = \underset{\text{Oxide of Silver.}}{Ag_2O} + \underset{\text{Nitrate of Calcium.}}{Ca2NO_3} + \underset{\text{Water}}{H_2O}$$

Arsenii Iodidum (AsI_3).

$$\underset{\text{Arsenicum.}}{As_2} + \underset{\text{Iodine.}}{3I_2} = \underset{\text{Arsenium Iodide.}}{2AsI_3}$$

Bismuthi Carbonas $\{(Bi_2O_2CO_3)_2,H_2O\}$.

$$\underset{\text{Bismuth.}}{Bi_2} + \underset{\substack{\text{Nitric}\\\text{Acid.}}}{8HNO_3} = \underset{\substack{\text{Nitrate of}\\\text{Bismuth.}}}{2Bi3NO_3} + \underset{\substack{\text{Nitric}\\\text{Oxide.}}}{2NO} + \underset{\text{Water.}}{4H_2O}$$

$$\underset{\substack{\text{Nitrate of}\\\text{Bismuth.}}}{4Bi3NO_3} + \underset{\substack{\text{Carbonate of}\\\text{Ammonium.}}}{3N_1H_{16}C_3O_8} = \underset{\substack{\text{Nitrate of}\\\text{Ammonium.}}}{12NH_4NO_3} + \underset{\substack{\text{Carbonate}\\\text{of Bismuth.}}}{2Bi_2O_2CO_3} + \underset{\substack{\text{Carbonic Acid Gas.}}}{7CO_2}$$

Bismuthi Citras ($BiC_6H_5O_7$).

$$\underset{\substack{\text{Subnitrate of}\\\text{Bismuth.}}}{BiONO_3} + \underset{\text{Nitric Acid.}}{2HNO_3} = \underset{\substack{\text{Nitrate of}\\\text{Bismuth.}}}{Bi3NO_3} + \underset{\text{Water.}}{H_2O}$$

$$\underset{\substack{\text{Bicarbonate of}\\\text{Sodium.}}}{3NaHCo_3} + \underset{\text{Citric Acid.}}{H_3C_6H_5O_7} = \underset{\substack{\text{Citrate of}\\\text{Sodium.}}}{Na_3C_6H_5O_7} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas.}}}{3CO_2} + \underset{\text{Water.}}{3H_2O}$$

$$\underset{\substack{\text{Nitrate of}\\\text{Bismuth.}}}{Bi3NO_3} + \underset{\substack{\text{Citrate of}\\\text{Sodium.}}}{Na_3C_6H_5O_7} = \underset{\substack{\text{Citrate of}\\\text{Bismuth.}}}{BiC_6H_5O_7} + \underset{\substack{\text{Nitrate}\\\text{of Sodium.}}}{3NaNO_3}$$

Bismuthi Oxidum (Bi_2O_3).

$$\underset{\substack{\text{Subnitrate}\\\text{of Bismuth.}}}{2BiONO_3} + \underset{\substack{\text{Hydrate of}\\\text{Sodium.}}}{2NaHO} = \underset{\substack{\text{Oxide of}\\\text{Bismuth.}}}{Bi_2O_3} + \underset{\substack{\text{Nitrate of}\\\text{Sodium.}}}{2NaNO_3} + \underset{\text{Water.}}{H_2O}$$

Bismuthi Subnitras ($BiONO_3,H_2O$).

$$\underset{\text{Bismuth.}}{Bi_2} + \underset{\text{Nitric Acid.}}{8HNO_3} = \underset{\substack{\text{Nitrate of}\\\text{Bismuth.}}}{2Bi3NO_3)} + \underset{\substack{\text{Nitric}\\\text{Oxide.}}}{2NO} + \underset{\text{Water.}}{4H_2O}$$

$$\underset{\substack{\text{Nitrate of}\\\text{Bismuth.}}}{5(Bi3NO_3)} + \underset{\text{Water.}}{8H_2O} = \underset{\substack{\text{Subnitrate of}\\\text{Bismuth.}}}{4(BiONO_3H_2O)} + \underset{\substack{\text{Nitrate of Bismuth}\\\text{in Acid.}}}{Bi3NO_3.8HNO_3}$$

Borax ($Na_2B_4O_7,10H_2O$).

$$\underset{\substack{\text{Boric}\\\text{Acid.}}}{4HBO_2} + \underset{\substack{\text{Carbonate of}\\\text{Sodium.}}}{Na_2CO_3} = \underset{\text{Borax.}}{Na_2B_4O_7} + \underset{\text{Water}}{2H_2O} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas.}}}{CO_2}$$

Bromum (Br).

$$\underset{\substack{\text{Sodium}\\\text{Bromide.}}}{2NaBr} + \underset{\substack{\text{Sulphuric}\\\text{Acid.}}}{2H_2SO_4} + \underset{\substack{\text{Black Oxide}\\\text{of Manganese.}}}{MnO_2} = \underset{\text{Bromine.}}{Br_2} + \underset{\substack{\text{Sulphate of}\\\text{Sodium.}}}{Na_2SO_4}$$

$$+ \underset{\text{Sulphate of Manganese.}}{MnSO_4} + \underset{\text{Water.}}{2H_2O}$$

Butyl-Chloral Hydras ($C_4H_3Cl_3O,H_2O$).

$$\underset{\text{Aldehyd.}}{2(C_2H_4O)} = \underset{\text{Crotonic Aldehyd.}}{C_4H_6O} + \underset{\text{Water.}}{H_2O}$$

$$\underset{\text{Crotonic Aldehyd.}}{C_4H_6O} + \underset{\text{Chlorine.}}{Cl_2} = \underset{\text{Monochlorocroton Aldehyd.}}{C_4H_5ClO} + \underset{\text{Hydrochloric Acid.}}{HCl}$$

$$\underset{\text{Monochlorocroton Aldehyd.}}{C_4H_5ClO} + \underset{\text{Chlorine.}}{Cl_2} + \underset{\text{Water.}}{H_2O} = \underset{\text{Butyl-Chloral Hydrate.}}{C_4H_3Cl_3O,H_2O}$$

Calcii Carbonas Præcipitata ($CaCO_3$).

$$\underset{\text{Chloride of Calcium.}}{CaCl_2} + \underset{\text{Carbonate of Sodium.}}{Na_2CO_3} = \underset{\text{Carbonate of Calcium.}}{CaCO_3} + \underset{\text{Chloride of Sodium.}}{2NaCl}$$

Calcii Chloridum ($CaCl_22H_2O$).

$$\underset{\text{Ferrous Chloride.}}{4FeCl_2} + \underset{\text{Chlorinated Lime.}}{Ca_2ClO} + \underset{\text{Slaked Lime.}}{4Ca(HO)_2} + \underset{\text{Water.}}{4H_2O} =$$

$$\underset{\text{Calcium Chloride.}}{5CaCl_2,2H_2O} + \underset{\text{Ferric Hydrate.}}{2Fe_2 6HO}$$

Calcii Hydras (CaH_2O_2).

$$\underset{\text{Lime.}}{CaO} + \underset{\text{Water.}}{H_2O} = \underset{\text{Hydrate of Calcium.}}{CaH_2O_2}$$

Calcii Hypophosphis ($Ca2PH_2O_2$).

$$\underset{\text{Phosphorus.}}{4P_2} + \underset{\text{Water.}}{6H_2O} + \underset{\text{Hydrate of Calcium.}}{3CaH_2O_2} = \underset{\text{Hypophosphite of Calcium.}}{3(Ca2PH_2O_2)} + \underset{\text{Phosphuretted Hydrogen.}}{2PH_3}$$

Calcii Phosphas ($Ca_3(PO_4)_2$).

$$\underset{\text{Phosphate of Calcium.}}{Ca_32PO_4} + \underset{\text{Hydrochloric Acid.}}{4HCl} = \underset{\text{Acid Phosphate of Calcium.}}{CaH_42PO_4} + \underset{\text{Chloride of Calcium.}}{2CaCl_2}$$

$$\underset{\text{Acid Phosphate of Calcium.}}{CaH_42PO_4} + \underset{\text{Chloride of Calcium.}}{2CaCl_2} + \underset{\text{Ammonia.}}{4NH_4HO} = \underset{\text{Phosphate of Calcium.}}{Ca_3(PO_4)_2}$$

$$+ \underset{\text{Chloride of Ammonium.}}{4NH_4Cl} + \underset{\text{Water.}}{4H_2O}$$

Calx (CaO).

$$\underset{\text{Carbonate of Calcium.}}{CaCO_3} + \text{Heat} = \underset{\text{Lime.}}{CaO} + \underset{\text{Carbonic Acid Gas.}}{CO_2}$$

Calx Chlorinata ($CaCl_2,CaCl_2O_2$).

$$\underset{\text{Hydrate of Calcium.}}{2CaH_2O_2} + \underset{\text{Chlorine.}}{2Cl_2} = \underset{\text{Chlorinated Lime.}}{CaCl_2,CaCl_2O_2} + \underset{\text{Water.}}{2H_2O}$$

Cerii Oxalas ($CeC_2O_4,3H_2O$).

$$\underset{\text{Cerite.}}{CeO} + \underset{\text{Hydrochloric Acid.}}{2HCl} = \underset{\text{Chloride of Cerium.}}{CeCl_2} + \underset{\text{Water.}}{H_2O}$$

$$\underset{\text{Chloride of Cerium.}}{CeCl_2} + \underset{\text{Oxalate of Ammonium.}}{(NH_4)_2C_2O_4} = \underset{\text{Oxalate of Cerium.}}{CeC_2O_4} + \underset{\text{Chloride of Ammonium.}}{2NH_4Cl}$$

Chloral Hydras (C_2HCl_3O,H_2O).

$$\underset{\text{Alcohol.}}{C_2H_5HO} + \underset{\text{Chlorine.}}{Cl_2} = \underset{\text{Aldehyd.}}{C_2H_4O} + \underset{\text{Hydrochloric Acid.}}{2HCl}$$

$$\underset{\text{Aldehyd.}}{C_2H_4O} + \underset{\text{Chlorine.}}{3Cl_2} = \underset{\text{Chloral.}}{C_2HCl_3O} + \underset{\text{Hydrochloric Acid.}}{3HCl}$$

$$\underset{\text{Chloral.}}{C_2HCl_3O} + \underset{\text{Water.}}{H_2O} = \underset{\text{Hydrate of Chloral.}}{C_2HCl_3O,H_2O}$$

Chloroformum ($CHCl_3$).

$$\underset{\text{Alcohol.}}{2C_2H_6O} + \underset{\text{Oxygen.}}{O_2} = \underset{\text{Aldehyd.}}{2C_2H_4O} + \underset{\text{Water.}}{2H_2O}$$

$$\underset{\text{Aldehyd.}}{C_2H_4O} + \underset{\text{Chlorine.}}{3Cl_2} = \underset{\text{Chloral.}}{C_2HCl_3O} + \underset{\text{Hydrochloric Acid.}}{3HCl}$$

$$\underset{\text{Chloral.}}{2C_2HCl_3O} + \underset{\text{Hydrate of Calcium.}}{Ca2HO} = \underset{\text{Formate of Calcium.}}{Ca2CHO_2} + \underset{\text{Chloroform.}}{2CHCl_3}$$

Cupri Nitras ($Cu(NO_3)_2,3H_2O$).

$$\underset{\text{Copper}}{3Cu_2} + \underset{\text{Nitric Acid.}}{8HNO_3} = \underset{\text{Nitrate of Copper.}}{3(CuNO_3)_2} + \underset{\text{Nitric Oxide.}}{2NO} + \underset{\text{Water.}}{4H_2O}$$

Cupri Sulphas ($CuSO_4,5H_2O$).

$$\underset{\text{Copper.}}{Cu_2} + \underset{\text{Sulphuric Acid.}}{4H_2SO_4} = \underset{\text{Sulphate of Copper.}}{2CuSO_4} + \underset{\text{Sulphurous Anhydride.}}{2SO_2} + \underset{\text{Water.}}{4H_2O}$$

FERRIC SALTS—

Ferri Peroxidum Hydratum ($Fe_2O_2(HO)_2$).

$$\underset{\text{Persulphate of Iron.}}{Fe_23SO_4} + \underset{\text{Hydrate of Sodium.}}{6NaHO} = \underset{\text{Moist Peroxide of Iron.}}{Fe_2O_3,3H_2O} + \underset{\text{Sulphate of Sodium.}}{3Na_2SO_4}$$

$$\underset{\text{Moist Peroxide of Iron.}}{Fe_2O_3,3H_2O} = \underset{\text{Peroxide of Iron.}}{Fe_2O_2,(HO)_2} + \underset{\text{Water.}}{2H_2O}$$

Ferri Acetatis Liquor Fortior.

$$\underset{\text{Persulphate of Iron.}}{Fe_23SO_4} + \underset{\text{Solution of Ammonia.}}{6NH_4HO} = \underset{\text{Ferric Hydrate.}}{Fe_26HO} + \underset{\text{Sulphate of Ammonium.}}{3(NH_4)_2SO_4}$$

$$\underset{\text{Ferric Hydrate.}}{Fe_26HO} + \underset{\text{Acetic Acid.}}{6HC_2H_3O_2} = \underset{\text{Acetate of Iron.}}{Fe_26C_2H_3O_2} + \underset{\text{Water.}}{6H_2O}$$

Ferri Dialysatus Liquor.

$$\underset{\text{Perchloride of Iron.}}{Fe_2Cl_6} + \underset{\text{Ammonia.}}{6NH_4HO} = \underset{\text{Ferric Hydrate.}}{Fe_2O_3} + \underset{\text{Chloride of Ammonium.}}{NH_4Cl} + \underset{\text{Water.}}{H_2O}$$

$$\underset{\text{Perchloride of Iron.}}{Fe_2Cl_6} + \underset{\text{Ferric Hydrate.}}{Fe_2O_3} + \underset{\text{Chloride of Ammoninm.}}{NH_4Cl} = \underset{\text{Oxychloride of Iron (Colloid).}}{Fe_2O_3,Fe_2Cl_6}$$

$$+ \underset{\text{Chlor. Amm. (Crystalloid.)}}{NH_4Cl}$$

Ferri Perchloridi Liquor Fortior (Fe_2Cl_6).

$$\underset{\text{Protochloride of Iron.}}{6FeCl_2} + \underset{\text{Hydrochloric Acid.}}{6HCl} + \underset{\text{Nitric Acid.}}{2HNO_3} = \underset{\text{Perchloride of of Iron.}}{3Fe_2Cl_6} + \underset{\text{Nitric Oxide.}}{2NO} + \underset{\text{Water.}}{4H_2O}$$

Ferri Pernitratis Liquor (Fe_26NO_3).

$$\underset{\text{Iron.}}{Fe_2} + \underset{\text{Nitric Acid.}}{8HNO_3} = \underset{\text{Pernitrate of Iron.}}{Fe_26NO_3} + \underset{\text{Nitric Oxide.}}{2NO} + \underset{\text{Water.}}{4H_2O}$$

Ferri Persulphatis Liquor ($Fe_2 3SO_4$).

$$\underset{\text{Protosulphate of Iron.}}{6FeSO_4} + \underset{\text{Sulphuric Acid.}}{3H_2SO_4} + \underset{\text{Nitric Acid.}}{2HNO_3} = \underset{\text{Persulphate of Iron.}}{3(Fe_2 3SO_4)} + \underset{\text{Nitric Oxide.}}{2NO} + \underset{\text{Water.}}{4H_2O}$$

Ferrum Redactum (Fe and Fe_3O_4).

$$\underset{\text{Ferric Oxide.}}{Fe_2O_3} + \underset{\text{Hydrogen.}}{3H_2} = \underset{\text{Iron.}}{Fe_2} + \underset{\text{Water.}}{3H_2O}$$

$$\underset{\text{Ferric Oxide.}}{3Fe_2O_3} + \underset{\text{Hydrogen.}}{H_2} = \underset{\text{Iron (Oxide).}}{2Fe_3O_4} + \underset{\text{Water.}}{H_2O}$$

Ferrum Tartaratum.

$$\underset{\text{Persulphate of Iron.}}{Fe_2 3SO_4} + \underset{\text{Ammonia.}}{6NH_4HO} = \underset{\text{Ferric Hydrate.}}{Fe_2 6HO} + \underset{\text{Sulphate of Ammonium.}}{3(NH_4)_2SO_4}$$

$$\underset{\text{Acid Tartrate of Potassium.}}{6KHC_4H_4O_6} + \underset{\text{Ferric Hydrate.}}{Fe_2 6HO} = \underset{\text{Tartarated Iron.}}{K_6Fe_2 6C_4H_4O_6} + \underset{\text{Water.}}{6H_2O}$$

FERROUS SALTS—

Ferri Arsenias ($Fe_3As_2O_8$).

$$\underset{\text{Arseniate of Sodium.}}{2Na_2HAsO_4} + \underset{\text{Bicarbonate of Sodium.}}{2NaHCO_3} + \underset{\text{Sulphate of Iron.}}{3FeSO_4} = \underset{\text{Arseniate of Iron.}}{Fe_3 2AsO_4} + \underset{\text{Sulphate of Sodium.}}{3Na_2SO_4} + \underset{\text{Carbonic Acid Gas.}}{2CO_2} + \underset{\text{Water.}}{4H_2O.}$$

Ferri Phosphas ($Fe_3P_2O_8$).

$$\underset{\text{Sulphate of Iron.}}{3FeSO_4} + \underset{\text{Phosphate of Sodium.}}{2Na_2HPO_4} + \underset{\text{Bicarbonate of Sodium.}}{2NaHCO_3} = \underset{\text{Phosphate of Iron.}}{Fe_3(PO_4)_2} + \underset{\text{Sulphate of Sodium.}}{3Na_2SO_4} + \underset{\text{Carbonic Acid Gas.}}{2CO_2} + \underset{\text{Water.}}{2H_2O}$$

Ferri Sulphas ($FeSO_4,7H_2O$); Ferri Sulphas Exsiccata ($FeSO_4,H_2O$); Ferri Sulphas Granulata ($FeSO_4.7H_2O$).

$$\underset{\text{Iron.}}{Fe_2} + \underset{\text{Sulphuric Acid.}}{2H_2SO_4} = \underset{\text{Sulphate of Iron.}}{2FeSO_4} + \underset{\text{Hydrogen.}}{2H_2}$$

Glycerinum $C_3H_5(HO)_3$.

$3NaHO + C_3H_33C_{18}H_{33}O_2 = C_3H_5(HO)_3 + 3NaC_{18}H_{33}O_2$

Hydrate of Sodium. (Caustic Soda). | Oleate of Glyceryl. (Vegetable Oil.) | Hydrate of Glyceryl. (Glycerine.) | Oleate of Sodium (Hard Soap).

MERCURIC SALTS—

Hydrargyrum Ammoniatum (NH_2HgCl).

$HgCl_2 + 2NH_4HO = NH_2HgCl + NH_4Cl + 2H_2O$

Perchloride of Mercury. | Ammonia. | Ammoniated Mercury. | Chloride of Ammonium. | Water.

Hydrargyri Flava Lotio (HgO).

$HgCl_2 + Ca2HO = HgO + CaCl_2 + H_2O$

Perchloride of Mercury. | Lime. | Yellow Oxide of Mercury. | Chloride of Calcium. | Water.

Hydrargyri Iodidum Rubrum (HgI_2).

$HgCl_2 + 2KI = HgI_2 + 2KCl$

Perchloride of Mercury. | Iodide of Potassium. | Red Iodide of Mercury. | Chloride of Potassium.

Hydrargyri Nitratis Acidus Liquor ($Hg2NO_3$).

$3Hg + 8HNO_3 = 3(Hg2NO_3) + 2NO + 4H_2O$

Mercury. | Nitric Acid. | Nitrate of Mercury. | Nitric Oxide. | Water.

Hydrargyri Oxidum Flavum (HgO)

$HgCl_2 + 2NaHO = HgO + 2NaCl + H_2O$

Perchloride of Mercury. | Hydrate of Sodium. | Yellow Oxide Mercury. | Chloride of Sodium. | Water.

Hydrargyri Oxidum Rubrum (HgO).

$Hg + Hg2NO_3 = 2HgO + 2NO_2$

Mercury. | Nitrate of Mercury. | Red Oxide of Mercury. | Nitric Peroxide

Hydrargyri Perchloridum ($HgCl_2$).

$HgSO_4 + 2NaCl = HgCl_2 + Na_2SO_4$

Persulphate of Mercury. | Chloride of Sodium. | Perchloride of Mercury. | Sulphate of Sodium,

Hydrargyri Persulphas ($HgSO_4$).

$$\underset{\text{Mercury.}}{Hg} + \underset{\text{Sulphuric Acid.}}{2H_2SO_4} = \underset{\substack{\text{Persulphate of}\\\text{Mercury.}}}{HgSO_4} + \underset{\substack{\text{Sulphurous}\\\text{Acid Gas.}}}{SO_2} + \underset{\text{Water.}}{2H_2O}$$

MERCUROUS SALTS—

Hydrargyri Nigra Lotio (Hg_2O in water).

$$\underset{\substack{\text{Subchloride}\\\text{Mercury.}}}{2HgCl} + \underset{\text{Lime.}}{Ca2HO} = \underset{\substack{\text{Black Oxide}\\\text{of Mercury.}}}{Hg_2O} + \underset{\substack{\text{Chloride of}\\\text{Calcium.}}}{CaCl_2} + \underset{\text{Water.}}{H_2O}$$

Hydrargyri Subchloridum ($HgCl$).

$$\underset{\substack{\text{Mercuric}\\\text{Sulphate.}}}{HgSO_4} + \underset{\text{Mercury.}}{Hg} = \underset{\substack{\text{Mercurous}\\\text{Sulphate.}}}{Hg_2SO_4}$$

$$\underset{\substack{\text{Mercurous}\\\text{Sulphate.}}}{Hg_2SO_4} + \underset{\substack{\text{Chloride of}\\\text{Sodium.}}}{2NaCl} = \underset{\substack{\text{Subchloride}\\\text{of Mercury.}}}{2HgCl} + \underset{\substack{\text{Sulphate}\\\text{of Sodium.}}}{Na_2SO_4}$$

Iodoformum (CHI_3).

$$\underset{\substack{\text{Ethylic}\\\text{Alcohol.}}}{C_2H_5HO} + \underset{\substack{\text{Carbonate}\\\text{Potassium.}}}{3K_2CO_3} + \underset{\text{Iodine.}}{4I_2} = \underset{\text{Iodoform.}}{CHI_3} + \underset{\substack{\text{Iodide of}\\\text{Potassium.}}}{5KI} +$$

$$\underset{\substack{\text{Formate of}\\\text{Potassium.}}}{KCHO_2} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas.}}}{3CO_2} + \underset{\text{Water.}}{2H_2O}$$

Iodum (I.)

$$\underset{\substack{\text{Iodide of}\\\text{Sodium.}}}{2NaI} + \underset{\substack{\text{Sulphuric}\\\text{Acid.}}}{2H_2SO_4} + \underset{\substack{\text{Oxide of}\\\text{Manganese.}}}{MnO_2} = \underset{\text{Iodine.}}{I_2} + \underset{\substack{\text{Sulphate}\\\text{of Sodium.}}}{Na_2SO_4} + \underset{\substack{\text{Sulphate of}\\\text{Manganese}}}{MnSO_4}$$

$$+ \underset{\text{Water.}}{2H_2O}$$

Lithii Citras ($L_3C_6H_5O_7,4H_2O$).

$$\underset{\substack{\text{Carbonate of}\\\text{Lithium.}}}{3L_2CO_3} + \underset{\text{Citric Acid.}}{2H_3C_6H_5O_7} = \underset{\substack{\text{Citrate of}\\\text{Lithium}}}{2L_3C_6H_7O_7} + \underset{\text{Water.}}{3H_2O} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas.}}}{3CO_2}$$

Magnesia Levis (MgO) Magnesia Ponderosa (MgO).

$$\underset{\substack{\text{Carbonate of}\\\text{Magnesium.}}}{3MgCO_3,Mg2HO} = \underset{\text{Magnesia.}}{4MgO} + \underset{\text{Water}}{H_2O} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas.}}}{3CO_2}$$

Magnesii Carbonas Levis
Magnesii Carbonas Ponderosa } $((MgCO_3)_3M(HO)_24H_2O)$

$$4MgSO_4 + 4Na_2CO_3 + 5H_2O = (MgCO_3)_3Mg(HO)_24H_2O$$

Sulphate of Magnesium. Carbonate of Sodium. Water. Carbonate of Magnesium.

$$+ \ 4Na_2SO_4 + CO_2$$

Sulphate of Sodium. Carbonic Acid Gas.

Magnesii Sulphas ($MgSO_4,7H_2O$).

$$MgCO_3 + H_2SO_4 = MgSO_4 + H_2O + CO_2$$

Carbonate of Magnesium. Sulphuric Acid. Sulphate of Magnesium. Water. Carbonic Acid Gas.

Phosphorus (P).

$$Ca_32PO_4 + 2H_2SO_4 = CaH_42PO_4 + 2CaSO_4$$

Bone Earth. Sulphuric Acid. Acid Phosphate of Calcium. Sulphate of Calcium.

$$3CaH_42PO_4 = Ca_32PO_4 + 4H_3PO_4$$

Acid Phosphate of Calcium. Phosphate of Calcium. Phosphoric Acid.

$$4H_3PO_4 + 8C_2 = 2P_2 + 6H_2 + 16CO$$

Phosphoric Acid. Carbon. Phosphorus. Hydrogen. Carbonic Oxide.

Plumbi Acetas ($Pb(C_2H_3O_2)_2,3H_2O$).

$$PbO + 2HC_2H_3O_2 = Pb(C_2H_3O_2)_2 + H_2O$$

Oxide of Lead. Acetic Acid. Acetate of Lead. Water.

Plumbi Subacetatis Liquor ($Pb_2C_4H_6O_5$).

$$PbO + Pb(C_2H_3O_2)_2 = Pb_2C_4H_6O_5$$

Oxide of Lead. Acetate of Lead. Subacetate of Lead.

Plumbi Iodidum (PbI_2).

$$2KI + Pb2NO_3 = PbI_2 + 2KNO_3$$

Iodide of Potassium. Nitrate of Lead. Iodide of Lead. Nitrate of Potassium.

Plumbi Nitras ($Pb2NO_3$).

$$PbO + 2HNO_3 = Pb2NO_3 + H_2O$$

Oxide of Lead. Nitric Acid. Nitrate of Lead. Water.

Plumbi Oxidum (PbO).

$$\underset{\text{Lead.}}{Pb_2} + \underset{\text{Oxygen.}}{O_2} = \underset{\text{Oxide of Lead.}}{2PbO}$$

Potassa Caustica (KHO).

$$\underset{\text{Carbonate of Potassium.}}{K_2CO_3} + \underset{\text{Hydrate of Calcium.}}{Ca2HO} = \underset{\text{Caustic Potash.}}{2KHO} + \underset{\text{Carbonate of Calcium.}}{CaCO_3}$$

Potassa Sulphurata ($K_2S_2O_3$,$2K_2S_3$).

$$\underset{\text{Carbonate of Potassium.}}{3K_2CO_3} + \underset{\text{Sulphur.}}{4S_2} = \underset{\text{Sulphurated Potash.}}{K_2S_2O_3,2K_2S_3} + \underset{\text{Carbonic Acid Gas.}}{3CO_2}$$

Potassii Acetas ($KC_2H_3O_2$).

$$\underset{\text{Carbonate of Potassium.}}{K_2CO_3} + \underset{\text{Acetic Acid.}}{2HC_2H_3O_2} = \underset{\text{Acetate of Potassium.}}{2KC_2H_3O_2} + \underset{\text{Water.}}{H_2O} + \underset{\text{Carbonic Acid Gas.}}{CO_2}$$

Potassii Bicarbonas ($KHCO_3$).

$$\underset{\text{Carbonate of Potassium.}}{K_2CO_3} + \underset{\text{Water.}}{H_2O} + \underset{\text{Carbonic Acid Gas.}}{CO_2} = \underset{\text{Bicarbonate of Potassium.}}{2KHCO_3}$$

Potassii Bichromas ($K_2Cr_2O_7$).

$$\underset{\text{Chrome Iron Ore.}}{2(FeOCr_2O_3)} + \underset{\text{Carbonate of Potassium.}}{4K_2CO_3} + \underset{\text{Oxygen.}}{O_7} = \underset{\text{Oxide of Iron.}}{Fe_2O_3} +$$

$$\underset{\text{Yellow Chromate of Potassium.}}{4K_2CrO_4} + \underset{\text{Carbonic Acid Gas.}}{4CO_2}$$

$$\underset{\text{Yellow Chromate of Potassium.}}{2K_2CrO_4} + \underset{\text{Sulphuric Acid.}}{H_2SO_4} = \underset{\text{Bichromate of Potassium.}}{K_2Cr_2O_7} + \underset{\text{Sulphate of Potassium.}}{K_2SO_4} + \underset{\text{Water.}}{H_2O}$$

Potassii Bromidum (KBr).

$$\underset{\text{Hydrate of Potassium.}}{6KHO} + \underset{\text{Bromine.}}{3Br_2} = \underset{\text{Bromide of Potassium.}}{5KBr} + \underset{\text{Bromate of Potassium.}}{KBrO_3} + \underset{\text{Water.}}{3H_2O}$$

$$\underset{\text{Bromide of Potassium.}}{10KBr} + \underset{\text{Bromate of Potassium.}}{2KBrO_3} + \underset{\text{Carbon.}}{3C_2} = \underset{\text{Bromide of Potassium.}}{12KBr} + \underset{\text{Carbonic Oxide.}}{6CO}$$

Potassii Chloras ($KClO_3$).

MnO_2 + $4HCl$ = $MnCl_2$ + $2H_2O$ + Cl_2
Black Oxide of Manganese. Hydrochloric Acid. Chloride of Manganese. Water. Chlorine.

$6Cl_2$ + K_2CO_3 + $6CaH_2O_2$ = $2KClO_3$ +
Chlorine. Carbonate of Potassium. Slaked Lime. Chlorate of Potassium.

$CaCO_3$ + $5CaCl_2$ + $6H_2O$
Carbonate of Calcium. Chloride of Calcium. Water.

Potassii Citras ($K_3C_6H_5O_7$).

$3K_2CO_3$ + $2H_3C_6H_5O_7$ = $2K_3C_6H_5O_7$ + $3H_2O$ + $3CO_2$
Carbonate of Potassium. Citric Acid. Citrate of Potassium. Water. Carbonic Acid Gas.

Potassii Cyanidum (KCN).

$K_4FeC_6N_6$ = $4KCN$ + FeC_2 + N_2
Ferrocyanide of Potassium. Cyanide of Potassium. Carbide of Iron. Nitrogeu.

Potassii Ferrocyanidum ($K_4FeC_6N_6,3H_2O$).

(Carbonate of Potassium and Nitrogen form, when fused, Cyanide of Potassium.)

$12KCN$ + Fe_2 + $4H_2O$ = $2K_4FeC_6N_6$ +
Cyanide of Potassium. Iron. Water. Ferrocyanide of Potassium.

$4KHO$ + $2H_2$
Caustic Potash. Hydrogen

Potassii Iodidum (KI).

$6KHO$ + $3I_2$ = $5KI$ + KIO_3 + $3H_2O$
Hydrate of Potassium. Iodine. Iodide of Potassium. Iodate of Potassium. Water.

$10KI$ + $2KIO_3$ + $3C_2$ = $12KI$ + $6CO$
Iodide of Potassium. Iodate of Potassium. Carbon. Iodide of Potassium. Carbonic Oxide.

Potassii Nitras (KNO_3).

K_2CO_3 + $2HNO_3$ = $2KNO_3$ + H_2O + CO_2
Carbonate of Potassium. Nitric Acid. Nitrate of Potassium. Water. Carbonic Acid Gas.

Potassii Permanganas ($KMnO_4$).

$6KHO$ + $KClO_3$ + $3MnO_2$ =
Hydrate of Potassium. Chlorate of Potassium. Black Oxide of Manganese.

$3K_2MnO_4$ + KCl + $3H_2O$
Manganate of Potassium. Chloride of Potassium. Water.

$3K_2MnO_4$ + $2H_2O$ = $2KMnO_4$ +
Manganate of Potassium. Water. Permanganate of Potassium.

$4KHO$ + MnO_2
Hydrate of Potassium. Black Oxide of Manganese.

Potassii Sulphas (K_2SO_4).

K_2CO_3 + H_2SO_4 = K_2SO_4 + H_2O + CO_2
Carbonate of Potassium. Sulphuric Acid. Sulphate of Potassium. Water. Carbonic Acid Gas.

Potassii Tartras ($K_2C_4H_4O_6H_2O$).

$2KHC_4H_4O_6$ + K_2CO_3 = $2K_2C_4H_4O_6$ +
Acid Tartrate of Potassium. Carbonate of Potassium. Tartrate of Potassium.

H_2O + CO_2
Water. Carbonic Acid Gas.

Potassii Tartras Acida ($KHC_4H_4O_6$).

$2H_2C_4H_4O_6$ + K_2CO_3 = $2KHC_4H_4O_6$ + CO_2 +
Tartaric Acid. Carbonate of Potassium. Acid Tartrate of Potassium. Carbonic Acid Gas.

H_2O
Water.

Soda Caustica ($NaHO$).

Na_2CO_3 + $Ca2HO$ = $2NaHO$ + $CaCO_3$
Carbonate of Sodium. Hydrate of Calcium. Caustic Soda. Carbonate of Calcium.

Soda Tartarata ($NaKC_4H_4O_6,4H_2O$).

Na_2CO_3 + $2KHC_4H_4O_6$ = $2NaKC_4H_4O_6$ +
Carbonate of Sodium. Acid Tartrate of Potassium. Tartarated Soda.

H_2O + CO_2
Water. Carbonic Acid Gas.

Sodii Arsenias ($Na_2HAsO_4,7H_2O$ & $Na_2HAsO_4,12H_2O$).

As_2O_3 + $2NaNO_3$ + Na_2CO_3 = $Na_4As_2O_7$
Arsenious Acid. Nitrate of Sodium. Carbonate of of Sodium. Pyroarseniate of Sodium.

$+ \underset{\text{Nitrous Anhydride.}}{N_2O_3} + \underset{\text{Carbonic Acid Gas.}}{CO_2}$

$\underset{\text{Pyroarseniate of Sodium.}}{Na_4As_2O_7} + \underset{\text{Water.}}{H_2O} = \underset{\text{Arseniate of of Sodium.}}{2Na_2HAsO_4}$

Sodii Bicarbonas ($NaHCO_3$).

$\underset{\text{Carbonate of Sodium.}}{Na_2CO_3} + \underset{\text{Water.}}{H_2O} + \underset{\text{Carbonic Acid Gas.}}{CO_2} = \underset{\text{Bicarbonate of Sodium.}}{2NaHCO_3}$

Sodii Bromidum (NaBr).

$\underset{\text{Hydrate of Sodium.}}{6NaHO} + \underset{\text{Bromine.}}{3Br_2} = \underset{\text{Bromide of Sodium.}}{5NaBr} + \underset{\text{Bromate of Sodium.}}{NaBrO_3} + \underset{\text{Water.}}{3H_2O}$

$\underset{\text{Bromide of Sodium.}}{10NaBr} + \underset{\text{Bromate of Sodium.}}{2NaBrO_3} + \underset{\text{Carbon.}}{3C_2} = \underset{\text{Bromide of Sodium.}}{12NaBr} + \underset{\text{Carbonic Oxide.}}{6CO}$

Sodii Carbonas ($Na_2CO_3,10H_2O$).

$\underset{\text{Chloride of Sodium.}}{2NaCl} + \underset{\text{Sulphuric Acid.}}{H_2SO_4} = \underset{\text{Sulphate of Sodium.}}{Na_2SO_4} + \underset{\text{Hydrochloric Acid.}}{2HCl}$

$\underset{\text{Sulphate of Sodium.}}{Na_2SO_4} + \underset{\text{Carbon.}}{2C_2} = \underset{\text{Sulphide of Sodium.}}{Na_2S} + \underset{\text{Carbonic Oxide.}}{4CO}$

$\underset{\text{Sulphide of Sodium.}}{Na_2S} + \underset{\text{Carbonate of Calcium.}}{CaCO_3} = \underset{\text{Carbonate of Sodium.}}{Na_2CO_3} + \underset{\text{Sulphide of Calcium.}}{CaS}$

Sodii Hypophosphis ($NaPH_2O_2$).

$\underset{\text{Hypophosphite of Calcium.}}{Ca2PH_2O_2} + \underset{\text{Carbonate of Sodium.}}{Na_2CO_3} = \underset{\text{Hypophosphite of Sodium.}}{2NaPH_2O_2} + \underset{\text{Carbonate of Calcium.}}{CaCO_3}$

Sodii Iodidum (NaI).

$\underset{\text{Hydrate of Sodium.}}{6NaHO} + \underset{\text{Iodine.}}{3I_2} = \underset{\text{Iodide of Sodium.}}{5NaI} + \underset{\text{Iodate of Sodium.}}{NaIO_3} + \underset{\text{Water.}}{3H_2O}$

$\underset{\text{Iodide of Sodium.}}{10NaI} + \underset{\text{Iodate of Sodium.}}{2NaIO_3} + \underset{\text{Carbon.}}{3C_2} = \underset{\text{Iodide of Sodium.}}{12NaI} + \underset{\text{Carbonic Oxide.}}{6CO}$

Sodii Phosphas ($Na_2HPO_4,12H_2O$).

$\underset{\text{Phosphate of Calcium, in Bone Ash.}}{Ca_32PO_4} + \underset{\text{Sulphuric Acid.}}{2H_2SO_4} = \underset{\text{Acid Phosphate of Calcium.}}{CaH_4,2PO_4} + \underset{\text{Sulphate of Calcium.}}{2CaSO_4}$

CaH_42PO_4 + Na_2CO_3 = Na_2HPO_4 + H_2O
Acid Phosphate of Calcium. Carbonate of Sodium. Phosphate of Sodium. Water.

+ CO_2 + $CaHPO_4$
Carbonic Acid Gas. Monocalcic Phosphate.

Sodii Salicylas $(NaC_7H_5O_3)_2H_2O$.

$2HC_7H_5O_3$ + Na_2CO_3 = $(NaC_7H_5O_3)_2$ + CO_2 + H_2O
Salicylic Acid. Carbonate of Sodium. Salicylate of Sodium. Carbonic Acid Gas. Water.

Sodii Sulphas $(Na_2SO_4,10H_2O)$.

$NaCl$ + H_2SO_4 = HCl + $NaHSO_4$
Chloride of Sodium. Sulphuric Acid. Hydrochloric Acid. Acid Sulphate of Sodium.

$2NaHSO_4$ + Na_2CO_3 = $2Na_2SO_4$ +
Acid Sulphate of Sodium. Carbonate of Sodium. Sulphate of Sodium.

H_2O + CO_2
Water. Carbonic Acid Gas.

Sodii Sulphis $(Na_2SO_3,7H_2O)$.

$2H_2SO_3$ + $Na_2CO_310H_2O$ = $2NaHSO_3,4H_2O$ +
Sulphurous Acid. Carbonate of Sodium. Acid Sulphite of Sodium.

CO_2 + $7H_2O$
Carbonic Acid Gas. Water.

$2NaHSO_34H_2O$ + $Na_2CO_3,10H_2O$ = $2Na_2SO_3,7H_2O$
Acid Sulphite of Sodium. Carbonate of Sodium. Sulphite of Sodium.

+ CO_2 + $8H_2O$
Carbonic Acid Gas. Water.

Sodii Sulphocarbolas $(NaC_6H_5SO_4,2H_2O)$.

H_2SO_4 + HC_6H_5O = $HC_6H_5SO_4$ + H_2O
Sulphuric Acid. Carbolic Acid. Sulphocarbolic Acid. Water

$(HC_6H_5SO_4)_2$ + Na_2CO_3 = $2NaC_6H_5SO_4$
Sulphocarbolic Acid. Carbonate of Sodium. Sulphocarbolate of Sodium.

+ CO_2 + H_2O
Carbonic Acid Gas. Water.

Sodii Valerianas ($NaC_5H_9O_2$).

$$C_5H_{11}HO + O_2 = HC_5H_9O_2 + H_2O$$
Amylic Alcohol. Oxygen. Valerianic Acid. Water.

$$HC_5H_9O_2 + NaHO = NaC_5H_9O_2 + H_2O$$
Valerianic Acid. Hydrate of Sodium. Valerianate of Sodium. Water.

Sulphur Præcipitatum (S).

$$12S + 3CaH_2O_2 = 2CaS_5 + CaS_2O_3 + 3H_2O$$
Sulphur. Slaked Lime. Polysulphide of Calcium. Hyposulphite of Calcium. Water.

$$2CaS_5 + CaS_2O_3 + 6HCl = 6S_2 + 3CaCl_2 + 3H_2O$$
Polysulphide of Calcium. Hyposulphite of Calcium. Hydrochloric Acid. Sulphur. Chloride of Calcium. Water.

Sulphuris Iodidum (S_2I_2).

$$S_2 + I_2 = S_2I_2$$
Sulphur. Iodine. Iodide of Sulphur.

Zinci Acetas ($Zn(C_2H_3O_2)_2,2H_2O$).

$$ZnCO_3(Zn2HO)_2H_2O + 6HC_2H_3O_2 = 3(Zn(C_2H_3O_2)_2 + 6H_2O + CO_2$$
Carbonate of Zinc. Acetic Acid. Acetate of Zinc. Water. Carbonic Acid Gas.

Zinci Carbonas ($ZnCO_3(Zn2HO)_2,H_2O$.

$$3ZnSO_4 + 3H_2O + 3Na_2CO_3 = ZnCO_3(Zn2HO)_2,H_2O + 3Na_2SO_4 + 2CO_2 + 2H_2O$$
Sulphate of Zinc. Water. Carbonate of Sodium. Carbonate of Zinc. Sulphate of Sodium. Carbonic Acid Gas. Water.

Zinci Chloridum ($ZnCl_2$).

$$Zn_2 + 4HCl = 2ZnCl_2 + 2H_2$$
Zinc. Hydrochloric Acid. Chloride of Zinc. Hydrogen.

Zinci Oxidum (ZnO).

$$ZnCO_3(Zn2HO)_2H_2O = 3ZnO + CO_2 + 3H_2O$$
Carbonate of Zinc. Oxide of Zinc. Carbonic Acid Gas. Water.

Zinci Sulphas ($ZnSO_4,7H_2O$).

$$\underset{\text{Zinc.}}{Zn_2} + \underset{\text{Sulphuric Acid.}}{2H_2SO_4} = \underset{\text{Sulphate of Zinc.}}{2ZnSO_4} + \underset{\text{Hydrogen.}}{2H_2}$$

Zinci Sulphocarbolas ($Zn(C_6H_5SO_4)_2,H_2O$).

$$\underset{\text{Sulphuric Acid.}}{H_2SO_4} + \underset{\text{Carbolic Acid.}}{HC_6H_5O} = \underset{\text{Sulphocarbolic Acid.}}{HC_6H_5SO_4} + \underset{\text{Water.}}{H_2O}$$

$$\underset{\text{Zinc Oxide.}}{ZnO} + \underset{\text{Sulphocarbolic Acid.}}{2C_6H_5HSO_4} = \underset{\text{Sulphocarbolate of Zinc.}}{Zn(C_6H_5SO_4)_2} + \underset{\text{Water.}}{H_2O}$$

Zinci Valerianas ($Zn2C_5H_9O_2$).

$$\underset{\text{Sulphate of Zinc.}}{ZnSO_4} + \underset{\text{Valerianate of Sodium.}}{2NaC_5H_9O_2} = \underset{\text{Sulphate of Sodium.}}{Na_2SO_4} + \underset{\text{Valerianate of Zinc.}}{Zn2C_5H_9O_2}$$

WEIGHTS AND MEASURES

OF THE

BRITISH PHARMACOPŒIA.

WEIGHTS.

1 Grain	gr.		
1 Ounce (Avoir.)	oz.	=	437·5 grains
1 Pound	lb. = 16 ounces	=	7000 ,,

MEASURES OF CAPACITY.

1 Minim	min.		
1 Fluid Drachm	fl. dr.	=	60 minims
1 Fluid Ounce	fl. oz.	=	8 fluid drachms
1 Pint	O.	=	20 fluid ounces
1 Gallon	C.	=	8 pints

MEASURES OF LENGTH.

1 Inch		in.
12 Inches	=	1 foot
36 „	=	3 feet = 1 yard

RELATION OF MEASURES TO WEIGHTS.

1 Minim	is the measure of		0·9114 grains of water
1 Fluid Drachm	„		54·6875 „
1 Fluid Ounce	„	1 ounce or	437·5 „
1 Pint	„	1·25 pounds or	8750·0 „
1 Gallon	„	10 pounds or	70,000·0 „

WEIGHTS AND MEASURES OF THE METRIC SYSTEM.

WEIGHTS.

1 Milligramme	=	the thousandth part of 1 grm.	or 0·001 grm.
1 Centigramme	=	the hundredth „	0·01 „
1 Decigramme	=	the tenth „	0·1 „
1 Gramme	=	weight of a cubic centimetre of water at 4° C. (15·432 grs.)	1·0 „
1 Dekagramme	=	ten grammes „	10·0 „
1 Hectogramme	=	one hundred grammes „	100·0 „
1 Kilogramme	=	one thousand grammes „	1000·0 „

MEASURES OF CAPACITY.

1 Millilitre	=	1 cub. centim.	or the mea. of 1 gram. of water	
1 Centilitre	= 10	„	10 „	„
1 Decilitre	= 100	„	100 „	„
1 Litre	=1000	„	1000 „	(1 kilo)

MEASURES OF LENGTH.

1 Millimetre	=	the thousandth part of 1 metre,	or 0·001 metre
1 Centimetre	=	the hundredth „	0·01 „
1 Decimetre	=	the tenth part „	0·1 „
1 Metre - - - - - - - - -			1·0 „

RELATION OF THE WEIGHTS OF THE BRITISH PHARMACOPŒIA TO THE METRIC WEIGHTS.

1 Pound	=	453·5927	grammes
1 Ounce	=	28·3495	„
1 Grain	=	0·0648	„

RELATION OF MEASURES OF CAPACITY OF THE BRITISH PHARMACOPŒIA TO THE METRIC MEASURES.

1 Gallon	= 4·543458	litres		
1 Pint	= 0·567932	„	or 567·932	cubic centimetres
1 Fluid Ounce	= 0·028397	„	28·397	„
1 Fluid Drachm	= 0·003550	„	3·550	„
1 Minim	= 0·000059	„	0·059	„

RELATION OF THE METRIC WEIGHTS TO THE WEIGHTS OF THE BRITISH PHARMACOPŒIA.

1 Milligramme	=	0·015432	grs.
1 Centigramme	=	0·15432	„
1 Decigramme	=	1·5432	„
1 Gramme	=	15·432	„
1 Kilogramme = 2 lbs. 3 oz. 119·8 grs., or		15432·349	„

RELATION OF THE METRIC MEASURES TO THE MEASURES OF THE BRITISH PHARMACOPŒIA.

1 Millimetre	=	0·03937	inches
1 Centimetre	=	0·39371	„
1 Decimetre	=	3·93708	„
1 Metre	=	39·37079	„ or 1 yard 3·37 inches
*1 Cubic Centimetre	=	15·432	grains.

1 Litre = 1·76077 pint, or 1 pint 15 oz. 1 dr. 43 m.

* The cubic centimetre is a standard at 4° C. (39°.2 F.), the grain at 62° F. (16°.66 C.)

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INDEX

OF

*POISONS AND THEIR ANTIDOTES.

Acids, Mineral.—The Stomach-pump should *not* be used. Alkalies—lime, soap, chalk, potash, soda, or magnesia—moderately diluted with water. In the absence of these, plaster off a wall, oils (almond or olive), and small doses of morphine hypodermically; all food should be given by the rectum.

Acid, Prussic (or Hydrocyanic).—Stomach, if possible, should be emptied by Pump or rapid emetic ($\frac{1}{2}$ dr. sulphate of zinc); hypodermic injections of atropine ($\frac{1}{60}$ gr.), ammonia, or whiskey, inhalation of oxygen, ammonia, or chlorine, cold and hot affusion alternately, and *artificial respiration*.

Freshly precipitated oxide of iron, followed by a solution of carbonate of potassium, is to some extent a chemical antidote, but *free stimulation* after the evacuation of the stomach must be alone relied upon.

Aconite (and Hellebore or Veratrine).—Pump or emetics; $\frac{1}{10}$ gr. apomorphine hypodermically, or a table-spoonful of mustard in warm water, or $\frac{1}{2}$ to 1 dr. sulphate of zinc. Stimulants—Whiskey and ammonia hypodermically, with 20 to 30 minims of *tincture of digitalis* or 2 minims liq. atropinæ.

* Murrell's "What to Do in Poisoning" should be in every Practitioner's instrument bag.

Strychnine may be given ($\frac{1}{30}$ gr.) by mouth, rectum, or hypodermically.

The patient should be kept horizontally on his back, and in a state of absolute rest, and sinapisms applied to the heart and extremities, and dry heat, friction, and artificial respiration.

Alcohol.—The Pump should be promptly used, and the stomach filled through it with strong coffee, to which a little ammonia should be added; or a hypodermic injection of 5 minims apomorphine solution, sinapisms, cold affusion, nitrite of amyl inhalation, or electricity may be tried, and in *desperate* cases boiling water, to cause immediate vesication of the skin over the soles of the feet.

Ammonia and Alkalies.—Pump should *not* be used. Weak acids (acetic preferable) may be given, largely diluted, and followed by draughts of almond or olive oil or melted butter, and demulcent drinks.

Tracheotomy may be required for the œdema of the glottis, and morphine hypodermically for the shock.

Antimony (Tartar Emetic).—Emetics or Pump not generally required, as vomiting sets in soon. Tannin, strong tea, or gallic acid, or any diluted astringent tincture or infusion containing tannin, may be freely given, followed up by the hypodermic or rectal administration of alcohol, to which small doses of digitalis or strychnine may be added.

Butter of Antimony.—The treatment of poisoning by this preparation of antimony should be the same as for the mineral acids—viz., magnesia, soap suds, chalk, potash, or soda, followed by oil and milk.

Arsenic.—Pump or Emetics, or 5 minims of apomorphine solution. Freshly-prepared moist peroxide of iron (prepared by adding soda or ammonia to the tincture of iron) or dialysed iron in ounce doses, diluted, or, in the absence of these, magnesia freely, or animal charcoal, olive oil, or lime water; demulcent drinks and stimulants by mouth or rectum.

Atropine and Belladonna.—Pump or Emetics, and afterwards the following:—Tannin, charcoal, or tea. Morphine ($\frac{1}{2}$ grain) by subcutaneous injection, or laudanum by the mouth, or pilocarpine ($\frac{1}{3}$ grain) subcutaneously, and purgatives.

The poison being excreted by the kidneys, the bladder should be emptied by the catheter to prevent reabsorption. Eserine in small doses has been advocated as an antagonist. Free stimulation, counter-irritation, and artificial respiration may be necessary.

Cannabis Indica.—Pump or Emeties, espeeially apomorphine hypodermieally (5 minims of B. P. injeetion), and treat symptoms as they present themselves ; purge and stimulate.

Camphor.—Pump or Emeties, and eopious draughts of water, with brisk saline eatharties, and general eounter-irritatiou, or eold and hot douehe alternately.

Cantharides.—Pump or Emeties, mueilagiuous drinks, or, in their absenee, oils, ehalk, a little opium by the mouth, and a morphine suppository by the rectum.

Carbolic Acid.—Pump or Emetics, and wash the stomaeh out with glyeerine, Epsom or Glauber's salt, in solution ; give oils, egg albumen, and warm mueilaginous drinks, with any soluble sulphate, and finally, freely stimulate, eounter-irritate, and injeet $\frac{1}{60}$ gr. atropiue.

Chloral Hydrate.—Pump or Emeties, especially 5 minim injeetions of Apomorphine solution, and injeetions of stryehnine ($\frac{1}{20}$ gr.), or of atropine ($\frac{1}{25}$ gr.), eaffein (5 grs.), or free stimulation with ammonia, whiskey, or ether, and sinapisms. *Particularly external warmth*, eleetrieity, and artifieial respiration ; inhalation of amyl nitrite may be tried.

Chlorine (when inhaled).—Inhalation of ammonia or H_2S ; (when swallowed)—albumen and mueilaginous drinks.

Chloroform.—Draw forward the tongue, artifieial respiration, eold affusion, free ventilation, inversion of the body. Hypodermieally, whiskey, ammonia, stryehnine, or digitalis, or inhalation of nitrite of amyl. Galvanism is doubtful. If the ehloroform has been swallowed, use the pump, or give 5 minims of apomorphine solution, and proeeed as if inhaled.

Colchicum.—Pump or Emetics, mucilaginous drinks, albumeu, or strong tea or tannin, and give a purgative. Stimulate, and treat symptoms.

Conium. — Pump or Emetics, tannin and eastor oil. Stimulate freely by ammonia. Hypodermics of strychnine or atropine may be tried, and artificial respiration persevered in.

Copper Salts.—Pump or Emeties, if free vomiting has not occurred; yellow prussiate of potassium, egg albumen and milk form insoluble eopper salts; mueilaginous drinks, and wheaten flour or water in which yolks of eggs are suspended, and the free use of opium to allay irritation.

Corrosive Sublimate.—See Mercury.

Creasote.—Same treatment as for Carbolic Aeid.

Croton Oil.—Emetics, or, if in the early stage, the gentle use of the Pump, demulcent drinks, soothing enemata, and opium—general treatment for irritant poisons. Free stimulation and counter-irritation may be necessary.

Cyanide of Potassium.—Treat as if Hydrocyanic Acid, and if seen at once give solution of Ferri Sulph.

Digitalis.—Pump or Emetics, especially sulphate of zinc ½ dram, or 5 minims of apomorphine solution hypodermically, tannin, or animal charcoal, free stimulation, and the hypodermic injection of $\frac{1}{120}$ gr. aconitine, and the free use of opium. Muscarin ($\frac{1}{3}$ gr.) is antagonistic, and alcohol should be given.

The patient should be kept absolutely quiet, and in the horizontal position.

Elaterium.—Emetics or the Pump. Demulcent drinks and opium freely, and general treatment of the symptoms of gastro-intestinal irritation.

Eserine, or Calabar Bean.—Emetics or Pump, with tannin or any tannin-containing liquid. Hypodermic injections of atropine ($\frac{1}{30}$ gr.) till the pupils widely dilate, afford the best chance; strychnine and chloral have been recommended.

Artificial respiration should be assiduously tried, and warmth and friction externally.

Ether (Inhalation).—Pull forward the tongue, give free current of air, commence artificial respiration, and treat as if Chloroform poisoning.

Fungi. or Muscarin.—Emetics or the Pump. Give atropine hypodermically ($\frac{1}{30}$ gr.), and repeat till pupils dilate, or digitalis or morphine may be given. Free stimulation, sinapisms, and friction.

Gelsemium.—Pump and Emetics. Bicarbonate of potassium and tannin freely given, warmth, free stimulation with alcohol, electricity, and artificial respiration.

Hypodermics of ammonia or atropine, or digitalis, are partially antagonistic; best result will follow 3 minims of atropine solution.

Hydrocyanic (or Prussic Acid).—Antidote and treatment described upon page 612 (under Acid, Prussic).

Hyoscyamus.—Same as for Atropine (page 613).

Iodine.—Emetics or the *cautious* use of the rubber tube of the Stomach Pump, and the free administration of starch,

arrowroot, bread, boiled potatoes, flour, lime-water, and demulcent drinks.

Laburnum.—Stomach pump, if possible, should be always used, even if vomiting has occurred, as portions of seeds, &c., may remain in the stomach. Free stimulation, and in bad cases hypodermic injection of ammonia, counter-irritation, friction, and cold douche.

Lead Salts.—Stomach Pump, or, preferably, a large emetic of sulphate of zinc, which is also an antidote; milk, white of egg, diluted sulphuric acid, Epsom or Glauber's salts, or phosphate of sodium, sulphuretted hydrogen, or Harrowgate water. Demulcent drinks, with mild opiates to allay pain and spasm.

Lime.—Carbonic Acid—any ærated water, as soda-water or lemonade; weak acetic acid or vinegar, freely diluted, and followed by oil or demulcent drinks.

Lobelia (or Tobacco).—Emetics or Pump. Tannin, free stimulation, externally by sinapisms, friction, and dry heat, internally or hypodermically by alcohol, ammonia, and ether, with strychnine ($\frac{1}{30}$ gr.), and small doses of opium, and the patient kept strictly in the horizontal position,

Mercury (Corrosive Sublimate).—Emetics or the very cautious use of the Pump. (The Pump should not be used except in the very early stages of the poisoning.) Albumen, or gluten (prepared by washing flour in a muslin bag), demulcent drinks, milk and oil, morphine and alcohol, subcutaneously.

Morphine.—See Opium.

Muscarin (or Mushrooms).—Same treatment as in poisoning by Fungi—viz., the subcutaneous administration of atropine after the use of an emetic or the Pump.

Nux Vomica.—See Strychnine.

Opium (or Morphine).—Pump, or, in its absence, Emetics (if capable of swallowing), or $\frac{1}{10}$ to $\frac{1}{5}$ gr. of apomorphine injected hypodermically. The stomach should be washed out with tepid water and filled with strong coffee or tea, or any infusion or liquid containing tannin.

Caffein, atropine, or strychnine hypodermically; flagellation, cold and hot affusions alternately; electricity; extensive sinapisms, or very hot water, to cause vesication in desperate cases; and when once aroused the patient should never be allowed to rest, but should be kept continually on the move. Artificial respiration may be required.

Nitric Acid.—See under Mineral Acids.

Oxalic Acid.—Pump or Emeties. Lime (lime and water, putty of lime, or ehalk) is the best antidote; one good dose of eastor oil; eounter-irritation, free stimulation, and the treatment for gastro-enterie inflammation.

Pilocarpine.—Pump or Emeties and free administration of tannin, and the hypodermie use of its antagonist—atropine—in $\frac{1}{40}$ to $\frac{1}{20}$ gr. doses.

Phosphorus.—Pump or Emeties. Sulphate of Copper (5 grs. every 15 minutes) is both antidote and emetie, Freneh oil of turpentine or any old oil of turpentine, purgatives, and demuleent drinks, eontaining magnesia and albumen (avoiding oils and butter).

Physostigma.—See under Eserine.

Potash (Caustie).—Emeties. Pump should *not* be used; weak acids (vegetable preferred, and largely diluted), oils and butter freely administered.

Potassium (Chlorate).—Pump or Emeties, profuse demulcent drinks and purgatives, hot blanket baths, and treatment as for aeute Bright's disease.

Silver Nitrate (or Lunar Caustie).—Large doses of eommon salt or sea water; emeties and pump (india rubber tube) should be used, and white of egg injeeted into the stomaeh after the poison is removed.

Yolk of egg, wheaten flour, or milk mixed with water should be freely administered.

Soda (Caustie).—Aeids and oils (as for Potash).

Stramonium.—Emeties, tannin, free stimulation, and hypodermie use of Morphine (same as for Atropine and Belladonna).

Strychnine.—Pump or Emeties, espeeially a hypodermie injeetion of $\frac{1}{10}$ to $\frac{1}{5}$ gr. Apomorphine. Chareoal or tannin in large quantities. Tobaeco by rectum (with great eaution—not more than 20 grains at once), bromide of potassium in large doses (2 drs. to 2 ozs.), ehloral, ehloroform, Calabar bean, coninm, morphine, ether, &c., are reeommended. The writer believes that poisonous doses of *alcohol* afford the best treatment, given both by mouth and reetum. Artifieial respiration may be tried.

Sugar of Lead.—Sulphate of zine, albumen, &e. (See Lead.)

Sulphurets and Sulphuretted Hydrogen.—Inhalation of air containing a small percentage of chlorine in it, and the free administration of a very weak solution of chlorinated lime or soda.

Sulphuric Acid.—See under Mineral Acids.

Tartar Emetic.—Tannin, green tea, &c. (See Antimony).

Tobacco.—Emetics, tannin, free stimulation, hypodermic injection of Strychnine ($\frac{1}{20}$ gr.) and the recumbent position strictly maintained (as for Lobelia).

Veratrine.—Pump or Emetics. Alcohol, opium, &c., as for Aconite (which see).

Zinc Salts (Chiefly the chloride, as Burnett's fluid).—The rubber tube of the stomach Pump used with caution, or Emetics, especially apomorphine $\frac{1}{10}$ gr. injected hypodermically. Egg albumen, tea, tannin, milk, alkalies or their carbonates, demulcent drinks, and soothing enemata containing a little laudanum.

WM. STRAIN AND SONS, PRINTERS, BELFAST.

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